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Good Engineering Ideas Will Win Automotive Supremacy in 1932

By

Norman G. Shidle

CONTINUED depression has energized automotive parts and vehicle companies into the most vigorous engineering activity that the industry has seen in years.

Results obtained during 1930 by companies which had something definitely new and striking to offer have convinced a majority of firms, apparently, that novel products forcefully merchandised can be made profit producers whatever general business conditions may be.

Throughout the industry today engineering departments are completing or have completed strikingly new designs, a majority of which will be ready for public announcement just before or just after the first of the year. The battle for business in 1932 will be fought on higher ground technically than ever before. We are going to witness the strongest and most stirring bidding for public approval on the basis of distinctive design that has been waged in many years.

A few conservatives are still debating the wisdom of "shooting the works" in 1932. An undercurrent of "playing safe" runs rather strongly through the executive channels of some parts and vehicle organizations even today. But generally speaking the "go-ahead"



Even now many companies are in position, ready to reach out for the plums of the 1932 market + + + + +

Nearly a year ago Fredrick E. Moskovics wrote a series of provocative articles in **AUTOMOTIVE INDUSTRIES** predicting bright opportunities for aggressive engineering design.

During the past months the industry has seen radical engineering innovations sell large quantities of cars.

This trend is gaining impetus, according to Norman Shidle, who has been talking with management, sales and engineering executives of the industry.

It is a report from the front; it shows how the various forces of the industry are aligned for the battle of the decade—the fight for leadership of some companies and the struggle for existence of others.

group is in the saddle. Next year will be their year. Things are going to happen.

A few duds are bound to be shot amidst the bombardment of new designs which will be hurled at a sales-dodging public as this year of bad business ends. Just as surely, though, there will be a large number of bull's-eye hits. Only time will tell who will make the hits and who will shoot the duds. It is the general opinion, however, that the next 18 months will be decisive in the history of more than one automotive concern. And the opinion is just as general among executives who should know what they are talking about, that only those who get out on the firing line with new ammunition and shoot it just as accurately and as forcefully as they possibly can, are going to be in the running.

While these factors will be reflected most quickly in the success or the lack of success of specific passenger car or truck companies, they will operate just as potently in determining the immediate future of particular parts and accessory companies as well. At a time when vehicle engineers are being pressed terrifically by their sales departments to pull rabbits out of a hat, the parts or accessory company which visits them with ideas, facilities and designs to help meet that pressure naturally is getting a better reception than the one which continues to call on the "any-parts-today" basis which has often characterized contacts in the past.

In the production end of the business there will be every attempt, of course, to put these new ideas into manufacture at the lowest possible cost. But the fact remains that so many new designs seem certain of adoption that some acceleration in machine-tool and factory-equipment buying seems almost certain within the next few months, however loath manufacturing concerns may be to make additional capital investments.

Following two years of relatively poor business, scores of companies who thus far have been hoping to hold on and weather the storm through sheer wait-

ing and economies have now reached the point where they feel that action and activity are absolutely essential to continued life. Merely to wait further, appeals to them as being merely to court a continuance of the attrition which has been going on for two years.

Scores of concerns have gradually been coming to the conclusion that they can't win from Old Man Depression on points. They are just in the process of deciding that in 1932 they must go in and swing hard—try for a knockout.

That's why a recent trip through the Middle West, coupled with several sessions with Eastern financial men, has convinced us that 1932 is going to be the most exciting, active and interesting year which has occurred in more than a decade for the automotive industry.

And the interesting part of it all is that, while there is a general move toward new designs and new products, there seems to be little uniformity of opinion as to the direction in which automotive design should go. Nearly everybody has a somewhat different idea. There are some engineers who think, for example, that further application of the "floating power" idea to six and eight-cylinder powerplants will mean a decline in the twelve and sixteen-cylinder vogue which began to gain a lot of headway a year or so ago.

There are others, equally prominent and experienced, who see multiplication of cylinders as one very important sales leverage. Conviction is strong enough on this score to make it certain at this time that there will be at least two or three new multi-cylinder cars battling for business in the \$2,000-and-up field next year, with present indications pointing to more twelves than sixteens.

Transmission and clutch development, upon which has been centered so much attention during the last 18 months, will again result in marked improvements in these units in more than a few of the 1932 models. In these units, particularly, there appears an excel-

lent example of the wholesome effect which competitive pressure can have on actual stock-car design.

All of the definite innovations which have come so rapidly in stock-car transmissions during the last 12 months have been available in principle for 10 or 15 years. Yet competitive pressure was needed to influence any general movement in the industry toward incorporation of these improved principles in actual practice.

It is safe to predict that continuous improvement in these particular units from the standpoint of easy shifting, driver convenience, and service stability, will take place without cessation from now until the end of 1933, at least. Important as will be the further changes in transmissions which will make their appearance within the next six months, there is every evidence that even the temporary "last word" along these lines will not be written immediately.

Speaking of the popularity of free wheeling in 1931, *Automotive Industries* quoted one engineer as far back as April 25, 1931, as saying: "It is likely that other companies will go to work on various types of easy gear-shifting devices, automatic transmissions and similar units, which may or may not incorporate free wheeling as one feature. . . . I have a hunch that, for competitive reasons, further steps rather than mere copies are likely to develop."

That prediction is now definitely in the process of being borne out.

In body design, too, marked innovations are scheduled to appear very shortly. There seems to be little chance that the much-talked-of "tear-drop" car will make its American debut as a stock product, but it will be surprising if several of the new designs do not reflect plainly the influence of the stimulated thinking about scientific streamlining which has been going on during recent months. The first easily recognizable beginnings of a movement toward the "tear-drop" type of body may be expected by New York show time—and probably will not be confined to a single line.

There is little doubt that in these two items—transmissions and bodies—will be the outstanding changes from the standpoint of public impression

and fresh sales appeal. In both cases such changes as are made will be obvious to the layman; he will be able readily either to feel them or see them. And it is probably for this very reason that these two items are getting the lion's share of attention from the engineers now busy creating 1932 motor cars.

Throughout the chassis and engine, however, will be innumerable improvements of a small, although not necessarily minor, nature. There is little evidence, however, of any important or radical developments in chassis design likely to be incorporated in stock models in the immediate future. Independent

"Any Parts Today?"

Parts and accessory companies which can help car and truck factories with novel, salable ideas are getting better reception than order-takers.

"Any parts today?" salesmanship is losing caste.

wheel suspension still intrigues the fancy of several eminently practical engineers, and when, as, and if it gets into stock production, it may bring in its wake greater changes in chassis detail in a few months than have been made in several years heretofore. Chassis revisions of this character seem unlikely, so far as we can make out, however, within a year.

Underlying this whole battle for business in which new design features will be an important part of the ammunition, however, it looks as though there were going to be an even more fundamental fight for basic position in the industry between various important firms, particularly among those in the passenger-car industry.

The belief has grown strong among executives of almost every concern that there isn't quite enough room in the field for all of the big companies now existing. Most thinking men grant the continued existence of a reasonably large number of passenger-car makers, even after the period of expansion of the industry has been wholly passed, but, they argue, there will be just a few really big ones and a goodly number of small ones. And looking at the history of the steel industry, there seems to be reason in this thinking.

But a number of passenger-car makers today already are so large in equipment, plant capacity and organization as to make it impossible for them individually to exist permanently and profitably as a relatively small factor. Despite the depression, many of these companies still are in excellent cash positions and are financially thoroughly stable. They

(Turn to page 359, please)

What 1932 Will See—

More multi-cylinder cars, twelves leading sixteens.

Extension of "floating power" idea.

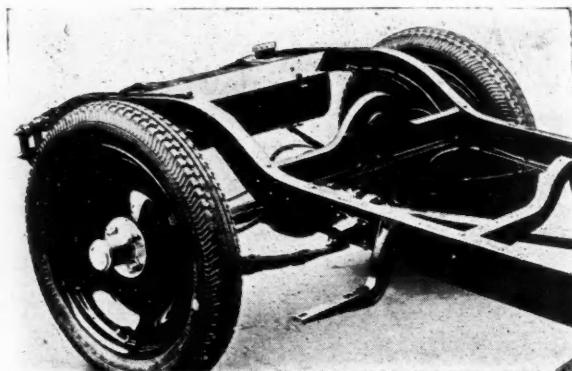
Improved transmissions.

More free-wheeling models.

Introduction of modified "tear drop" bodies.

Entry of some companies into a wider range of price classes.

New Opel Four-Cylinder Model Has Parts Interchangeable With the Six



Six cross-members stiffen the chassis frame of the Opel Four + + +

AFTER the introduction last year of the new six-cylinder Opel car with 110 c. in. piston displacement the Adam Opel Co. of Rüsselsheim in Germany has now also brought out the new four-cylinder model, the coming of which has long been expected. The new small car is as neat a design as the six-cylinder, which in outward form it closely resembles. It has a wheelbase of 90 in., track in front of 44 in. and at the rear of 45 in. with a ground clearance under the front axle of 8 in. and under the rear axle of 7.8 in.

Many parts of the new cars are identical with those of the other model. Bore and stroke are the same, namely 2.56 in. and 3.54 in., enabling the same pistons, connecting rods, valves, etc. to be employed. The four cylinders are cast integral with the crankcase, the sump being only a light steel pressing containing the gear lubrication pump. The piston displacement is 71.7 c. in. and the motor has a constant output of 22 hp. at 3400 r.p.m. The crankshaft runs in three bronze-backed white metal bearings, of which the front one measures 1.81 in. diameter, 1.65 in. length, the middle 1.89 in. and 2.00 in. and the rear 1.93 in. and 2.12 in. respectively. The connecting rods have a length from center to center of 7.16 in. and their feet are directly lined with white metal, the diameter of the big end being 1.77 in. and the length 1.26 in. The connecting rods have I-sections and are bored their entire length to admit of direct pressure lubrication of the full-floating wrist pins, which are retained by spring clips and work in bronze bushings. Nelson-Bohnalite pistons with three rings are employed. All three rings are above the wrist pin and the upper two serve as compression rings while the lower is an oil scraper. The compression rings

have a breadth of 0.11 in., the other ring 0.19 in.

A high compression head of cast iron is employed with the valves arranged standing on the right side. They slant inward toward the top and are operated in the orthodox manner by a camshaft in the crankcase with tappets and pushrods. The valves have a diameter of 1.14 in., while their stems measure 0.27 in., which is also the height of the stroke. All valves have interchangeable cast iron guides with a clearance of 0.078 in. on the inlet and 0.098 in. on the outlet valves. The compression ratio is 6 to 1.

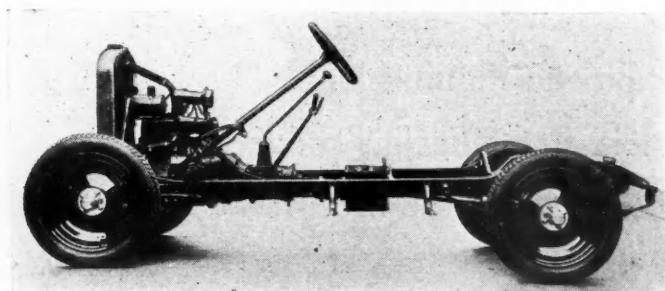
The camshaft is driven at the front end by helical gears. The projecting end of the crankshaft carries a pulley for a V-belt, which drives the generator on a bracket above the front end of the motor and simultaneously the two-blade fan.

The electrical system is supplied by the Robert Bosch Co.

A special Solex carburetor is employed. It is fed by a diaphragm fuel pump drawing the fuel from a tank holding 6.6 gallons suspended at the rear end of the chassis. The pump is driven off the camshaft in the usual manner.

A relatively large radiator is employed as the car is destined not only for use in Germany but also in tropical territories. It is for this reason also that a water pump is provided. The cooling system contains 2.19 gallons of water.

A single plate clutch with a friction surface of 43.4 sq. in. is employed. The three-speed gearbox is blocked on, and an open propeller shaft of 1.57 in. diameter takes the drive to a banjo-type rear axle. Two universal joints wholly inclosed and running in oil are used, the front one being attached to the driven shaft of the gearbox within the brake drum there provided. The propeller shaft at this end is splined so it can slide inside the joint, while the other end is fixed to the

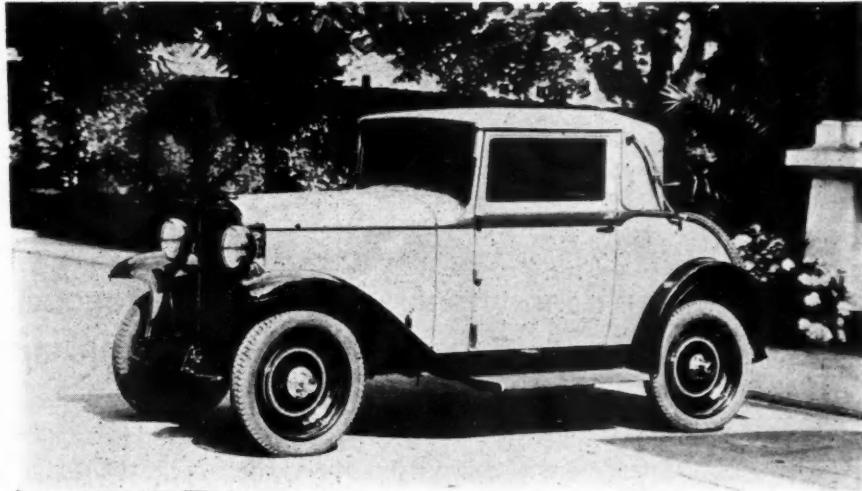


The chassis frame of the Opel Four is of cold pressed steel

Many

By

Edwin P. A. Heinze



second universal joint. Propulsion and torque are taken up by the rear springs, which, same as the front springs, are semi-elliptic.

The front springs have 5 and the rear 8 leaves 1.57 in. broad and with a total thickness in front of 1.06 in. and at the back of 1.61 in., the lengths being respectively 29 in. and 42.27 in. The springs are retained by bolts and shackles. High pressure gun lubrication is provided.

The wheels are of the disk type with tires 4 x 18 on 3½ x 18 rims. Each wheel has a brake drum of 8 in. diameter. The brakes consist of two shoes with servo action. The friction area amounts to 33 sq. in. The four-wheel brakes are operated by pedal, brake-shaft and straight cables. The transmission brake is of the band type with a drum 6 in. in diameter, the friction surface measuring 32 sq. in. The transmission ratio of the front wheel brakes is 1 to 46, of the rear wheel brakes 27.6 and of the transmission brake 1 to 24.8.

Worm and sector steering gear is used giving an over-all reduction ratio of 15.3 to 1. The gear is adjustable, the worm wheel being supported by two tapered roller bearings. It is only partially self locking and enables the car to turn within a road breadth of 39 ft. without reversing. The front axle is of the Mercedes type with I-section and the wheels are supported on ball bearings, which are also employed in the rear axle. The steering wheel has a diameter of 15.75 in. It has three spokes and the signal button in the center.

The frame has two longitudinal members of cold pressed steel of 0.13 in. thickness with a bed height of 3.54 in. and a flange breadth of 1.49 in. Six transverse members are provided.

The bodywork is a hardwood frame work with steel panels, the whole of the rear wall forming a single pressing. The body rests on felt and every possible provision is made to prevent noises developing. The two doors have four broad hinges and their lower edges are lined with rubber. Owing to the fuel tank being located at the rear, ample foot room has been available for the front seats. Nevertheless care has been taken to prevent the car assuming a stub-nose appearance by becoming too short. The dashboard has been made practically gas-tight, the control apertures being well covered by rubber. Under the bonnet a tool box is fitted in the dashboard, where it is very accessible, though the way the loose lid is secured by means of two butterfly nuts does not appear to be an ideal solution. The exhaust pipe is led down at the forward

The Opel four-cylinder line consists of saloon, sunshine saloon, roadster-cabriolet and truck bodies + + +

end of the engine, so undue heat transmission through the dashboard into the car is thereby prevented. Also the crankcase is provided with an atmospheric connection through a pipe leading down beneath the car, where the driving wind draws out oil vapours.

The front seats are adjustable, and not only can the seats be turned up but also the rounded backs can be folded down. The windshield is fixed slantingly and the roof supports are narrow. The panes in the doors can be let down, while those beside the rear seats are fixed. The rear seats are not of the usual type worked on a frame, but are cushions laid into a molded steel pressing. They are thus wholly free from noises of working spiral springs. Arm rests are provided on both sides. While being sufficiently broad, the foot space is not very large. But in a car of this size more space can scarcely be provided. On the whole the rear seats are very comfortable. The general equipment includes a pneumatic windscreen wiper, a speedometer, oil pressure gage, the usual switches also for direction indicators, which are fitted, and carburetor choke. The latter is of a special type having a valve preventing the engine drawing in too much fuel when starting. Also an instrument panel light and a ceiling light are provided.

The front axle is equipped with hydraulic shock absorbers. Ignition is automatically controlled and the battery is located beneath the left front seat. The gearbox gives the following transmission ratios to 1: 3, 1.6 and 1, reverse: 3.86 to 1. The reduction ratio in the rear axle is 5.14 to 1. The chassis weighs 1235 lb. and is capable of carrying a weight of 1210 lb. The car is supplied with a normal saloon body, with a so-called sunshine saloon body having sliding roof, as two-seater roadster without rumble seats, the place of which is taken by a large luggage bunker and as delivery truck. The doors of the saloon cars have a breadth of 33½ in., while the breadth of the whole car amounts to 55.11 in., and the height to 64 in. The saloon is being sold in Germany at \$643, the sunshine saloon at \$688, the roadster-cabriolet at \$595, the truck at \$572 and the chassis at \$429. Complete with water, oil and fuel ready for driving away, the saloon weighs 1730 lb., the sunshine saloon 1740 lb., the roadster 1720 lb. and the truck 1685 lb. The latter is able to carry a load of 765 lb.

Low Oil Viscosity and Higher Injection Pressure Improves Diesel Engine Spray

Pennsylvania State College conducts experiments with constant pressure and pump injection systems

In a paper on "Dispersion of Sprays in Solid-Injection Oil Engines," read at the National Oil and Gas Power Meeting at Madison, Wis., June 23-26, the author, Kalman J. De Juhasz, assistant professor of engineering research, Pennsylvania State College, described some experiments made at the State College Experiment Station to determine those characteristics of sprays which are of interest from the engine performance point of view. He said that even though its laws have not yet been formulated, spray formation is subject to physical laws, and under the same conditions, that is, for the same values of the governing factors, the sprays always have the same properties. The characteristics of the spray, including its dispersion in the combustion air, depend upon three sets of factors, as follows:

1. *Fuel factors*, including oil pressure, specific gravity, viscosity, and surface tension.
2. *Nozzle factors*, including size and shape of the channels and apertures through which the fuel passes.
3. *Combustion-air factors*, including its density, (pressure and temperature), and its state of stagnation or agitation.

Two injection systems were investigated:

1. Constant-pressure injection with mechanically operated valve.
2. Pump injection with hydraulically operated valve (Robert Bosch type). In the constant-pressure injection system the oil can be put under pressure by means of a hand-operated, or by a power-operated pump.

In experiments on sprays it is necessary to separate one single injection, but without altering thereby the conditions prevailing when continuously repeated injections are made. There are two ways of accomplishing this: First by actuating the flywheel, cam-shaft, and cam continuously at the specified speed, but preventing it from lifting the cam follower and the valve, except for a single injection. This method was used with the constant-pressure injection system. The second method is by actually producing repeated injections and shielding the measuring apparatus from all sprays except one. This method was used with the pump-injection system.

In both instances a so-called "selector mechanism" is used which moves the cam axially and thus brings it into engagement with its follower whenever a trigger is pulled.

The nozzle is fixed, by means of a circular flange, to the air-chamber cover, which is a 2-in.-thick steel plate of 20 in. diameter. It is bolted onto a large cast-iron platform forming the foundation of the whole equipment.

The injection is made into the air chamber, which is a 36-in.-long piece of 10-in.-diameter seamless steel tube, closed hemispherically on one end and arranged so as to be bolted hermetically onto the chamber cover mentioned. The air chamber can be filled with air at any required pressure. The air is compressed by a motor-driven compressor and stored conveniently in a battery of steel bottles.

The apparatus used in dispersion experiments consists of two parts:

1. The discharge cup for catching the total discharge of the spray, and
2. The dispersion rack for catching portions of the spray at definite locations in space.

There is in reality a group of five cups, mounted on a sector. Each cup can be brought in front of the nozzle. The cups are filled with cotton waste, or with some other absorbent material, and from their increment of weight after injection the weight of the injected fuel can be calculated.

The dispersion rack is a skeleton upon which absorbent pads can be fastened for intercepting the spray at a number of predetermined locations in space. In the experiments 41 pads were used on the rack. In carrying out the experiments first of all discharge tests were taken, then the dispersion rack was put in place and carefully lined up coaxially with the spray. The chamber was closed and filled with air at the required pressure and then one or two injections were made.

After this the chamber was opened up and the weight increment of the pads determined. In view of the large number of weighings a sensitive spring balance (Paulin, Roller-Smith type) was used which greatly reduced the weighing time, and maintained satisfactory accuracy. Much attention was given to developing a method of representation for the spray pattern. The weight increment of the pad is equivalent to the quantity of oil passing, during the duration of the spray, through that area in space occupied by the pad.

The results obtained in the tests so far point to the following general conclusions:

1. The dispersion becomes more even when the injection pressure is increased.
2. The dispersion becomes more even when the oil viscosity is decreased.
3. The dispersion becomes more even when the air density is increased.
4. The cone angle increases with increasing oil pressure, increasing air density, and decreasing viscosity of oil.
5. The percentage of oil reaching a given distance increases as the spray cone angle decreases.

JUST AMONG OURSELVES

Eyes Front!

THE armies of business are on the march!

Next year is going to witness a real battle for supremacy in the automotive field and the smart generals will start their cavalcades this fall. Laggards who wait for January, 1932, may be left at the post.

Need for definite movement in this tail of the business depression is being made clear on all sides, through all industries. What is true of business in general will be true in our own industry. This new spirit which can be seen arising in recent weeks was well expressed to us by one company president yesterday, when he said:

"It is time the courageous and the wise resist the attempts at destruction of the timid and the panicky. The tearing down process in this country has been going on long enough.

"The object of business is profit through service. We can return to a healthy demand only through increased buying power and the only way we can have buying power is through profits."

Merle Thorpe in *Nation's Business* points out currently, in discussing various attitudes toward the depression, that "there are men who are facing and conquering formidable adversities. There are minds that are advancing the nation toward a new prosperity.

"They are members," he says, "of that select company who attack when others hesitate, who believe when others doubt, who

dare when others are accumulating excuses for timidity."

"1931 is still business history in the writing. Your own chapter will be what you make it."

Mr. Thorpe speaks words we all may well heed. Only the short-sighted will rest on their oars waiting for a date on the calendar to change.

When Management Engineers

"THE immediate responsibility for design lies with the head of the engineering department, but when this department is overruled by the management—either through deliberate intent, neglect or misunderstanding—then the responsibility for design passes to management.

"... More designs go wrong through bad management than through poor engineering."

So says L. E. Jermy in the current issue of *Machine Design*. The italics are ours. "More designs go wrong through bad management than through poor engineering." There's something for a few chief executives to sit and meditate about while pondering over the ashes of their after-dinner cigars. If Mr. Jermy is right, there's more wrong with management than there is with engineering.

The Opinion That Goes Over

OUR own observation in the automotive field indicates that he may be right. Every engineer has a few pet ideas, to be

sure, but most informal arguments between engineers that we have sat in on have ended up with more or less general agreement about fundamentals after everybody has had his ideas pretty well assimilated by everybody else.

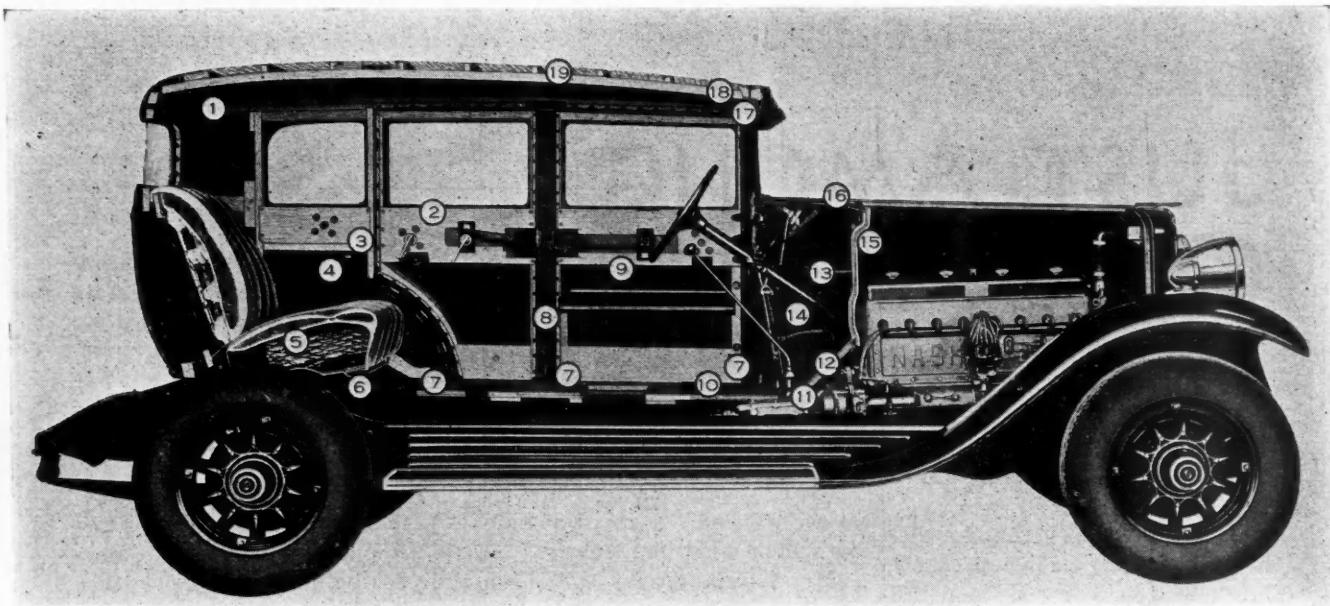
Not so with discussions between general executives. Used to commanding and used to having his opinions accepted rather readily, each general executive seems to come out of the discussion with most of his own original ideas and relatively little assimilation of other ideas projected. That isn't true of the great executives of the industry, to be sure. But it is true of some.

Maybe we're wrong and maybe Mr. Jermy is wrong; can't be too sure about a thing of this kind, of course. At any rate we'd welcome any frank opinions on the subject from engineers or executives—and we'll promise to keep the opinions anonymous if we print any of them.

The Peak is at Fifty-five

EARNING power of the typical mechanical engineer is greatest at the age of 55, according to a report of a survey made public by the American Society of Mechanical Engineers, the largest engineering society in the world, with a membership of nearly 20,000.

The maximum professional income of one-half of the mechanical engineers of the country who were at this age in 1930 was \$7,600. A quarter of the group earned \$12,500, and one-tenth more than \$25,000. Salaries are lowest in the Far West, and highest in New York.—N.G.S.



Cutaway view of the Nash body. The numbers referring to the table on the next page

Body Silencing Practice at the Nash Plant Embodies New Ideas

Felt or wool padding, anti-squeak material, special rubberized fabric, and plastic compound all contribute to the sound-proofing and thermal insulation of Nash bodies + + +

DETAILS of the body silencing features embodied in the new Nash models lay particular emphasis on sound-proofing and thermal insulation which characterize current practice. Recently *Automotive Industries* made a study of the basic principles involved and the manner in which these have been translated into actual production. The first article, published April 4, 1931 (p. 542), dealt with engineering phases; the second, published April 18, 1931 (p. 620), analyzed the methods employed by a number of prominent body builders.

Specific practices incorporated in the new Nash designs offer further interesting ideas along similar lines. The illustration shows a cutaway view of one of the Nash cars to reveal constructional features. Focal points of insulation have been suitably numbered and are briefly described in the table. Although the body is of composite construction and consequently

inherently damped against "drumming," metal panels are coated with a plastic compound over which is laid a felt padding to afford additional security.

All points are insulated with felt or wool padding supplemented by anti-squeak material and a special rubberized fabric where required. Dash insulation is very interesting as it includes both acoustic and thermal protection, both sides of the panel being overlaid with pads of fiber composition and felt for this purpose. This should prove an effective barrier to under-the-hood heat and sound.

An analysis of these constructional details shows the growing importance of insulating materials and their utilization. Among the most important of these are: felt, cork, rubber, anti-squeak strips, etc. One of the most interesting developments is that of rubberized fabric and we understand that much experimental work is in progress in this field.

Nash Body Insulation Covers 19 Points

1. Anti-squeak insulating material is inserted between metal and wood wherever these materials meet, as in roof braces, rafters and netting.
2. Laminated wood—non-warping and permanently silent—is used for all lock boards, seat and cushion frames.
3. Concealed door checks with large, live-rubber bumpers quiet all doors.
4. An efficient drain pan and hose prevents accumulation of water in the rear body quarter.
5. Spiral springs are silenced by cotton pads.
6. The metal rear seat support is thoroughly insulated by anti-squeak fabric.
7. Steel pillar posts, wheelhouse and pillar braces are quieted by anti-squeak fabric.
8. The pillar post is insulated from the frame by rubberized fabric.
9. Steel-and-wood doors are fully insulated to eliminate drumming.
10. Floor boards of five-ply laminated wood, instead of metal, stop rumbling noises. Thick felt padding under a heavy rubber mat covers the floor.
11. Ply-wood toe boards, asbestos sheeted, eliminate motor heat and sound.
12. Steel dash-to-sill braces are applied to the wood over coverings of plastic compound and a layer of anti-squeak material.
13. Front end construction, entirely of steel, is insulated by heavy padding.
14. Complete interior insulation of the body is achieved by coating the metal panels with plastic compound, over which felt padding is applied.
15. Both sides of the dash panel are insulated with fiber composition and felt to dissipate heat and sound through the hood louvers.
16. Heavy wool padding is applied to the bracing of the upper and side cowl panels to prevent friction, vibration and sound.
17. Plastic material and rubberized fabric separate wood roof rafters from the metal shell.
18. U-shaped header bar is insulated from the roof rail.
19. Roofs are completely silenced and protected by plastic compound and rubberized fabric.

What is the Action of This Automatic Clutch?

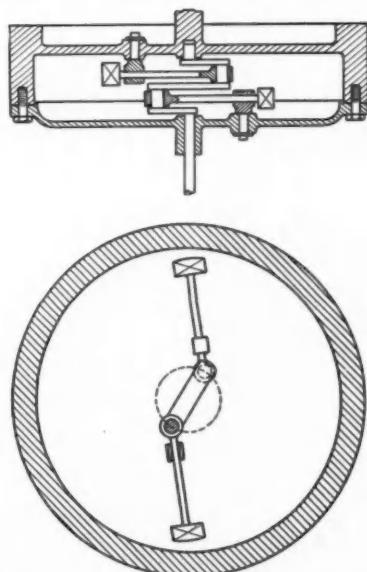
RECENTLY there has been considerable interest in automatic clutches. There are several types of such clutches, the most familiar being one employing governor weights which press friction members in contact with a force which is dependent upon the speed of the driving member. A less familiar type is illustrated by the drawing herewith. This is covered by French patent No. 513869, issued to Th. Lafitte of Paris. The single claim of this patent reads substantially as follows:

"An automatic coupling comprising a driven shaft, a flywheel keyed to same and carrying oscillating guides, and connecting rods adapted to slide in said guides, one end of these rods being connected to a crank keyed to the driven shaft and the other carrying a mass intended to produce centrifugal effects."

It is obvious that if the driving shaft of this coupling is rotated at a low speed and a heavy torque load is connected to the driven shaft, the latter will remain stationary and the connecting rods will revolve around the stationary crankpins, reciprocating in their guides.

It is also obvious that if the driving shaft rotates at a high speed while there is only a light torque load on the driven shaft, the masses on the connecting rods will assume positions near the rim of the flywheel and the driven shaft will be carried along with the driving shaft; in other words, the clutch will be engaged.

But what will be the effect on the driven shaft if the speed of the driving shaft is gradually increased from, say, idling to full speed of a gasoline engine, the torque load on the driven shaft being assumed to be less than the maximum torque of the engine?



Lafitte automatic clutch, based on a centrifugal principle

"Who's Who" in Free Wheeling Lists

The data you've wanted on free wheel units and the new transmissions are here in tabular form

CAR MAKE AND MODEL	Trans-mission Make	No. of Forward Speeds	Synchro-nizing Clutches	FREE WHEELING						GEARS			
				Standard or Optional	Unit Make	Unit Type	Location	In	Lock-out Location	Teeth	Type	Shift	
Auburn.....	8-98	Detroit	3	Yes	S-C	L. G. S.	Spring	R-T	All-F	F-RT	Helical	C-M	S-E
Austin.....	W-G	3	No	None	None	None	None	None	None	Spur	Slide	C-M	Clash
Buick.....	8-50	Own	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Buick.....	8-60	Own	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Buick.....	8-80, 8-90	Own	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Cadillac.....	355	Own	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Cadillac.....	370	Own	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Cadillac.....	452	Own	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Chevrolet.....	Own	3	No	None	None	None	None	None	None	Spur	Slide	Clash	
Chrysler.....	Six	Own	3	No	Opt	Own	Roller	R-T	All-F	Inst	Helical	C-M	S-E
Chrysler.....	70	Own	4	No	None	None	None	None	None	Spur	I-C-M	S-E	
Chrysler.....	DeL. Eight	Own	4	No	None	None	None	None	None	Spur	I-C-M	S-E	
Chrysler.....	Imp. 8	Own	4	No	None	None	None	None	None	Spur	I-C-M	S-E	
Cord.....	L-29	Detroit	3	.....	None	None	None	None	None	Spur	Slide	Clash	
Cunningham.....	V-9	Own	3	No	None	None	None	None	None	Spur	Slide	Clash	
De Soto.....	Six	Own	3	No	Opt	Own	Roller	R-T	All-F	Inst	Helical	C-M	S-E
De Soto.....	8	Own	3	No	Opt	Own	Roller	R-T	All-F	Inst	Helical	C-M	S-E
De Vaux.....	6-75	N-P	3	.....	None	None	None	None	None	Helical	C-M	.....
Dodge Brothers.....	Six	Own	3	No	Opt	Own	Roller	R-T	All-F	Inst	Helical	C-M	S-E
Dodge Brothers.....	Eight	Own	3	No	Opt	Own	Roller	R-T	All-F	Inst	Helical	C-M	S-E
Duesenberg.....	J	Own	3	No	Opt	Own	Spring	R-T	All-F	F-RT	Spur	Slide	S-E
du Pont.....	C	W-G	3	No	None	None	None	None	None	Spur	Slide	Clash	
Durant.....	6-10	Own	3	No	None	None	None	None	None	Spur	Slide	Clash	
Durant.....	6-12	Own	3	No	None	None	None	None	None	Spur	Slide	Clash	
Durant.....	6-14	Own	3	No	None	None	None	None	None	Spur	Slide	Clash	
Durant.....	6-19	.....	3	No	Opt	W-G	Roller	R-T	All-F	F-RT	Spur	Slide	Clash
Essex.....	Super 6	Own	3	No	Opt	W-G	Roller	R-T	All-F	F-RT	Spur	Slide	Clash
Ford.....	A	Own	3	No	None	None	None	None	None	Spur	Slide	Clash	
Franklin.....	15 W G	3 & 4	No	Opt	W-G	Roller	R-T	All-F	F-RT	Spur	Slide	Clash	
Graham.....	Pros. 6	W-G	3	No	Opt	W-G	Roller	R-T	All-F	F-RT	Spur	Slide	Clash
Graham.....	Std. 6	W-G	3	No	Opt	W-G	Roller	R-T	All-F	F-RT	Helical	I-C-M	S-E
Graham.....	Spec. 6	W-G	4	Yes	Opt	W-G	Roller	R-T	All-F	F-RT	Helical	I-C-M	S-E
Graham.....	Spec. 8-20	W-G	4	Yes	Opt	W-G	Roller	R-T	All-F	F-RT	Helical	I-C-M	S-E
Graham.....	8-34	W-G	4	Yes	Opt	W-G	Roller	R-T	All-F	F-RT	Helical	I-C-M	S-E
Hudson.....	Great 8	Own	3	No	Opt	W-G	Roller	R-T	All-F	F-RT	Spur	Slide	Clash
Hupmobile.....	S-2 W-G	3	No	Std	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash	
Hupmobile.....	S-2 W-G	3	No	Std	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash	
Hupmobile.....	L W-G	3	No	Std	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash	
Hupmobile.....	C W-G	3	No	Std	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash	
Hupmobile.....	H. U W-G	3	No	Std	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash	
LaSalle.....	345	Own	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Lincoln.....	8	Own	3	No	Std	Own	Roller	T-M	2-High	ISL	Helical	C-M	S-E
Marmont.....	70	.....	3	No	Opt	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Marmont.....	88	Detroit	3	No	Opt	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Marmont.....	16	Muncie	3	Yes	None	None	None	None	None	Spur	C-M	S-E	
Nash.....	960	Own	3	Yes	Opt	Det	Roller	R-T	All-F	F-RT	Helical	C-M	S-E
Nash.....	970	Own	3	Yes	Opt	Det	Roller	R-T	All-F	F-RT	Helical	C-M	S-E
Nash.....	980	Own	3	Yes	Opt	Det	Roller	R-T	All-F	F-RT	Helical	C-M	S-E
Nash.....	990	Own	3	Yes	Opt	Det	Roller	R-T	All-F	F-RT	Helical	C-M	S-E
Oakland.....	8 Muncie	3	Yes	None	None	None	None	None	None	Spur	C-M	S-E	
Oldsmobile.....	F-31 Muncie	3	Yes	None	None	None	None	None	None	Spur	C-M	S-E	
Packard.....	901	Own	4	Yes	None	None	None	None	None	Spur	C-M	S-E	
Packard.....	902	Own	4	Yes	None	None	None	None	None	Spur	C-M	S-E	
Packard.....	903	Own	4	Yes	None	None	None	None	None	Spur	C-M	S-E	
Packard.....	904	Own	4	Yes	None	None	None	None	None	Spur	C-M	S-E	
Peerless.....	Std. Eight	W-G	3	No	None	None	None	None	None	Spur	I-C-M	Clash	
Peerless.....	Master Eight	W-G	4	No	None	None	None	None	None	Spur	I-C-M	Clash	
Peerless.....	Custom Eight	W-G	4	No	Std	W-G	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Pierce-Arrow.....	43	Own	3	No	Std	Own	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Pierce-Arrow.....	41-42	Own	3	No	Std	Own	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Plymouth.....	Own	3	No	Std	Own	Roller	R-T	All-F	Inst	Helical	C-M	S-E	
Pontiac.....	Own	3	No	None	None	None	None	None	None	Spur	Slide	Clash	
Reo.....	6-21	Own	3	No	None	None	None	None	None	Hrgbne	C-M	Clash	
Reo.....	25N	Own	3	No	None	None	None	None	None	Hrgbne	C-M	Clash	
Reo.....	31N; Roy 35N	Own	3	No	None	None	None	None	None	Hrgbne	C-M	Clash	
Reo.....	8-21	Own	3	No	None	None	None	None	None	Hrgbne	C-M	Clash	
Rolls-Royce.....	Phantom	Own	3	No	None	None	None	None	None	Spur	Slide	Clash	
Studebaker.....	Six	Own	3	No	Std	Own	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Studebaker.....	Dict. 8	Own	3	No	Std	Own	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Studebaker.....	Command. 70	Own	3	No	Std	Own	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Studebaker.....	President	Own	3	No	Std	Own	Roller	T-M	2-High	ISL	Helical	C-M	Clash
Stutz.....	LA	Detroit	4	No	None	None	None	None	None	Spur	I-S	Clash	
Stutz.....	MA	Detroit	4	No	None	None	None	None	None	Spur	I-S	Clash	
Stutz.....	MB	Detroit	4	No	None	None	None	None	None	Spur	I-S	Clash	
Willys-Knight.....	66D	Own	3	No	Opt	W-G	Roller	R-T	All-F	Inst	Spur	Slide	Clash
Willys Six.....	97	Own	3	No	Opt	W-G	Roller	R-T	All-F	Inst	Spur	Slide	Clash
Willys Six.....	98D	Own	3	No	Opt	W-G	Roller	R-T	All-F	Inst	Spur	Slide	Clash
Willys Eight.....	8-80D	Own	3	No	Opt	W-G	Roller	R-T	All-F	Inst	Spur	Slide	Clash
Willys-Knight.....	95	Own	3	No	Opt	W-G	Roller	R-T	All-F	Inst	Spur	Slide	Clash

ABBREVIATIONS:

All-F—All forward speeds
 C-M—Constant mesh
 Det—Detroit Gear & Machine Co.
 F-RT—On floor at rear of transmission

Hrgbne—Herringbone
 I-C-M—Internal constant mesh
 Inst—Instrument panel
 I-S—Internal sliding
 ISL—In shift lever
 N-P—New Process

Opt—Optional
 R-T—Rear of transmission
 S-C—Standard on custom models
 S-E—Silent engagement
 T-M—Transmission main shaft
 W-G—Warner Gear

Nearly Half of All Models Marketed

**Roller clutch type used in 36 models
out of 38 available with free wheeling**

CHANGES in transmission and free-wheeling equipment have come so fast during the past year that it has been hard for anybody to keep track of them.

The tabulation on the opposite page, correct as of Aug. 15, 1931, has been compiled by *Automotive Industries* to provide in ready reference form information regarding stock car transmission specifications as they stand today. It tells what models have free wheeling, what kind of free wheeling each has, where synchro-mesh has been adopted, and so forth.

Within 90 days part of the table will be out of date, and within five months its details will need complete overhauling. *Automotive Industries* will bring it up to date for you again at that time.

Free wheeling is now obtainable, the tabulation reveals, on practically one-half of all the models marketed—or, to be exact, on 38 out of 78. It is standard on 14 models only, however, and in one case it is standard only on what are called the de luxe series of this model, while in the case of 24 models it can be had optionally at extra cost.

The roller clutch is the predominant type of free wheeling, since it is represented on 36 models out of 38 which may be had with free-wheeling feature.

There are two locations for the free-wheeling device. It is either incorporated in the transmission—and is then located in the sliding member by means of which the high speed and the next to highest speed are engaged—or it is a separate device which is located at the rear of the transmission. The important difference is that in the former location the free-wheeling device is effective in the two highest forward speeds only, whereas in the latter it is effective in all forward speeds. When located back of the transmission some provision must be made to cut out the free-wheeling device automatically when the reverse gear is engaged, as otherwise the car could not be backed up. Of the 38 models obtainable with free wheeling, 24 have the device mounted at the rear of the transmission, while 12 have it incorporated in the sliding member between the direct drive and the next-to-highest gear.

Since mounting of the free-wheeling device back of the transmission makes the free wheeling effective on all forward speeds, while incorporations in the high-speed sliding member limits its effectiveness to the high and next-to-high speeds, in 24 models the free wheeling is effective on all forward speeds, while in 14 models it is effective on the two highest speeds only.

All free-wheeling devices are so arranged that they can be rendered ineffective when desired, so that the engine can be used as a brake. In fact, free-wheeling devices not possessing this feature are illegal in some of the states and therefore could not be used in a stock car for general distribution. When the free-wheeling device is incorporated in the sliding member, it is locked by means of the shift lever, which is

merely moved beyond its normal position. This arrangement is found on 14 of the 38 models available with free wheeling. With the free-wheeling device located back of the transmission a special locking lever is provided, and this is located on the instrument board on 11 models and on the floor back of the transmission in 13.

The introduction of such features as the silent second speed and free wheeling has worked considerable changes in transmission design, and the old sliding-gear transmission, which practically monopolized the field about four years ago, has passed into the minority. Of the transmissions in the 78 models listed, 52 have their gears in constant mesh, seven of these having internal gears. Twenty-six still have sliding gears, and of these the sliding gears are of the internal type in three models.

All except two of the models equipped with free-wheeling devices have other than spur gears in their transmissions. In 32 transmissions there are gears of the helical type, while four are equipped with herringbone gears. These gears, of course, are used to give a silent second speed, and that they are found together with free wheeling on many models is probably due mainly to the fact that transmissions with silent second speeds and the free-wheeling device were introduced in this country by the same firm.

Free Wheeling in 1932 Models

One of the most interesting points to look for in the multitude of new model announcements which are due between now and Feb. 1, 1932, will be whether free wheeling will have made still further progress or whether its advance, which has been so rapid during the past year, has been checked.

Of the total of 78 models covered by the accompanying tabulation, 51—or about 65 per cent—are equipped with the car maker's own transmission. Of the remaining 27, 15 are equipped with transmissions of the Warner Gear Co., six with transmissions of the Detroit Gear Co., three with transmissions of the Muncie Products Corp. and one with a New Process.

As to the number of forward speeds in the transmission, it is well known that one maker, Franklin, offers an option on three-speed and four-speed transmissions. Of the remaining 77 models, 62 carry three-speed and 15 four-speed transmissions. To properly judge the present standing of the two types, it may be of help to mention that at the beginning of 1928 only seven models out of 110 had four-speed transmissions, and these included four Graham-Paige models which had only recently been equipped with the Warner Hi-flex transmission.

Twenty-two models of the 78 are equipped with synchronizing clutches, including nine General Motors models and 13 others. This feature also has made very rapid headway, having been originally introduced on Cadillac and LaSalle cars in August, 1928.

Bendix Clutch Control Has Free-Wheeling Advantages

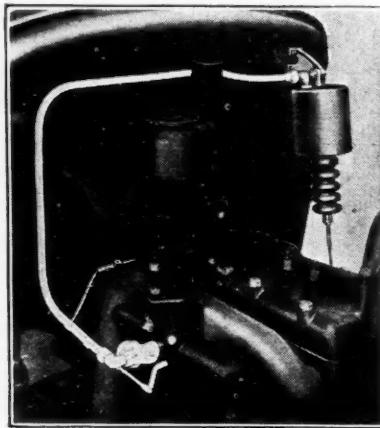


Fig. 1—Bendix clutch control installed on Ford car

AN automatic clutch control, operated by the inlet-manifold vacuum, has been placed on the market by the Bendix Aviation Corp., South Bend, Ind. It eliminates the need for the driver depressing the clutch pedal when he wants to shift gears, as the mere release of the accelerator pedal causes the clutch to be disengaged. When the accelerator is depressed again the clutch is automatically engaged, and the engagement is said to be smoother than when the control is in the usual way by clutch pedal.

The mechanism is actuated by a vacuum cylinder connected by a metal tube through a valve to the intake manifold, and a piston in the vacuum cylinder connected by cable to the clutch pedal.

When the vacuum is "on," it draws the piston and pulls the clutch pedal down, disengaging the clutch. When the vacuum is "off" the piston returns and the clutch pedal comes up, engaging the clutch automatically.

The vacuum is turned "on" or "off" by the valve in the vacuum line between the vacuum cylinder and the manifold. This valve is operated wholly by the accelerator, to which it is connected by a short cable.

Operation of the device is accomplished through a vacuum cylinder and piston actuated from the inlet manifold and accelerator pedal + + +

Fig. 1 shows the clutch control installed on a Ford, with the valve connected to the manifold and the tubing leading to the vacuum cylinder.

Fig. 2 shows the general principle of the Bendix clutch control. Vacuum cylinder A is connected by a metal tube through a valve E to the intake manifold B. Piston C in the vacuum cylinder is connected by cable to the clutch pedal D. The moment a driver removes his foot from the accelerator, the vacuum in the intake manifold increases and then draws the piston, which in turn pulls down the clutch pedal, disengaging the clutch. When the accelerator is pushed down again vacuum is reduced, the piston returns, and the clutch pedal comes up, engaging the clutch automatically. Valve E is connected to the accelerator by a short cable.

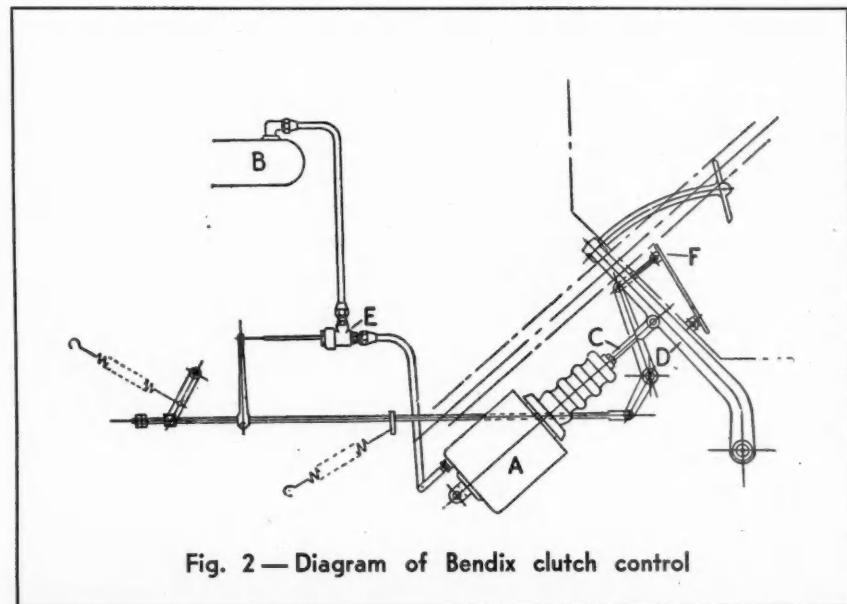


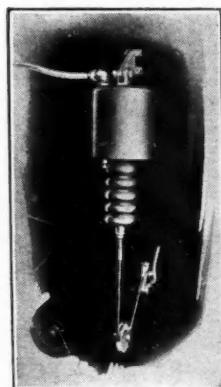
Fig. 2—Diagram of Bendix clutch control

Fig. 3—Close-up view of vacuum cylinder + +

Fig. 3 is a close-up of the vacuum cylinder, showing the cable attachment to the clutch pedal.

Within the idling range of the throttle lever—that is, the range between the position of closed throttle and the point where the accelerator starts down, valve adjustment is said to be exact and permanent. With the hand throttle set at any point within this range the clutch control operates. If it is desired to operate the car in the conventional manner it is only necessary to move the hand throttle slightly out of this range.

Elimination of fatigue is seen as one of the outstanding points for clutch control, particularly with women drivers. Likewise, longer clutch life should result because the clutch is mechanically and smoothly



operated, eliminating the driver's tendency to "ride" the clutch pedal. It is also pointed out that clutch control should overcome the timid driver's inherent fear of shifting gears in traffic because the timing is mechanically exact.

Another factor stressed by the manufacturer is that clutch control gives the sensation and all advantages of free wheeling without the necessity of physical clutch operation, yet is entirely optional with the driver. With clutch control it is only necessary for the driver to lift his foot from the accelerator and the vehicle coasts with a minimum fuel consumption and wear on parts. Should the engine stall, as sometimes occurs while free wheeling, the vacuum is dissipated, the clutch is automatically engaged, and the car's momentum cranks the engine.

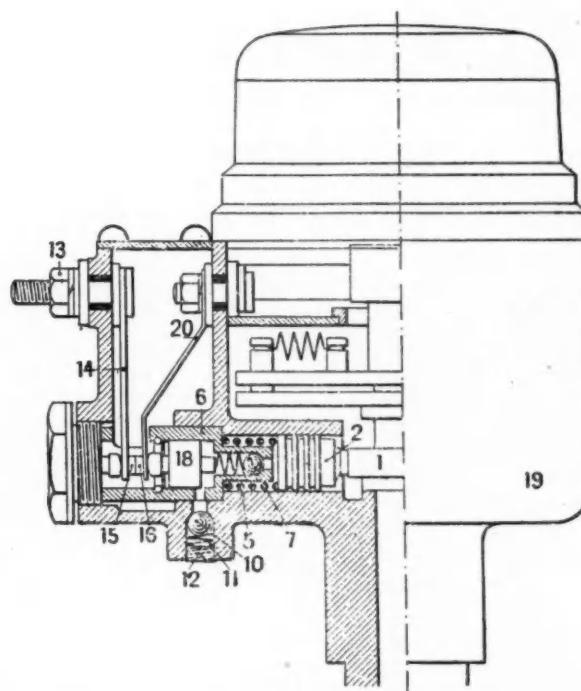
As a safety feature, the Bendix clutch control is so made that it is entirely selective and optional. The motorist can return to conventional drive by merely moving the hand throttle to that point where it starts to push the foot throttle down. When that is done, the clutch is operated with the left foot.

Clutch control units are now being manufactured on a quantity basis at the plant in South Bend, and the units will be sold through garages and service stations throughout the country.

Automatic Ignition Switch Is Actuated by Variation in the Air Pressure

ABOUT ten years ago certain cars manufactured in this country carried a thermostat-actuated ignition switch which automatically opened the ignition circuit if the driver stalled his engine and forgot to open the switch. A device designed to accomplish the same object but operating on a different principle has been evolved in France recently and is illustrated herewith, the cut being reproduced from *La Vie Automobile*. An automatic switch which is closed as long as the engine is revolving and opens as soon as the engine stops is combined with the regular ignition unit. The circuit is closed by a variation in the air pressure acting on a piston, the air pressure being obtained from a small pump operated by the distributor shaft.

In the drawing 19 is the housing of the distributor, within which turns the distributor shaft, which is provided with a cam 1, that acts on the piston 2, the latter being returned by the spring 5. Within the head of this piston there is a valve which allows air to pass during the instroke of the piston. During the outward stroke of the piston this ball valve closes, and the air pressure thus created in the space ahead of it presses on the piston 18. This piston in turn presses against the spring 20, thus bringing the contact points 15 and 16 together. The air chamber is provided with a relief valve 10 which maintains the pressure in it at a constant value. If the engine stops the air escapes from the chamber in a few seconds and the contacts are drawn apart by the spring 20.



Collard automatic ignition switch

Stresses in Truck Frames From Dead Oscillation Can be Predicted

by

J. B. Reynolds¹ and

H. A. Soulis²

COMMERCIAL automobile trucks are constructed in a variety of ways. They consist essentially of a body upon a frame which is supported at two or more points by springs attached to the axles. Each type of truck presents its own problems in the determination of frame stresses, but similar procedure will lead to results in all cases. An analysis in the case of one kind of truck should be helpful to those interested in such problems.

The type of truck referred to consists of a hauling unit followed by a trailer which carries the load. This trailer is supported near the front end by the hauling unit and in the rear by heavy leaf springs mounted upon an axle and fastened at the ends to the frame of the trailer. Stresses in the frame result chiefly from three causes: dead load, accelerated motion and oscillation.

It is the purpose of this paper to present methods of computing approximately the stresses due to each of these causes. Simplifying assumptions are made in each case, but it is believed that the errors thus introduced do not seriously affect the validity of the results obtained. There is a demand on the part of buyers that trucks be as light as the necessary strength will permit. This makes it desirable to be able to predict probable stresses.

Trailer Frame Regarded as Beam

In finding the frame stresses due to dead load, it is assumed that the loaded trailer may be replaced by a beam, carrying a uniform load of w lb. per ft., supported near one end and at two other points, these latter being the points of attachment of the springs to the frame. The reactions at these two points are assumed equal, since the springs are symmetrically placed on the axle and the moment about the axle is zero. The uniform load is taken as the pay load, on the supposition that the truck body is strong enough to support its own weight and stresses due to motion. A general expression for the moment in the beam at any point in the long span is set up, and the location and magnitude of the maximum moment, M_1 , are determined from it. From this the fiber stress s_1 is found the section modulus f of the beam or frame being known.

The stress due to acceleration is computed for the case when the truck is being stopped by a given braking effect producing a retardation, a . Part of this effect is due to brakes applied to the rear wheels causing a known moment around the rear axle which must be balanced by a difference in the reactions at the ends

of the springs. A forward inertia force, Wa/g , equal to the product of a and the mass, W/g , of the load is introduced at the assumed center of gravity of the load.

We have not taken the maximum possible braking effort. Tests have shown that a very high retarding effort can be obtained on certain types of road. The average maximum figure is taken as 60 per cent of the weight on the axle. This is very seldom obtained on a heavy unit, due to power limitations and the possibility of sliding the tires. If tires were to slide, tire wear would be excessive. It will be clear from the method of analysis that the braking effect can be chosen at will. Again, considering the trailer as a beam, we assume that there act upon it, besides the spring reactions, the reaction at the front support and the weight of the pay load, a horizontal force represented by the known friction between the wheels and the ground and another represented by the backward push of the hauling unit, to which brakes are also applied. In addition to these there acts at the center of the beam a horizontal force equal to the inertia force mentioned above, combined with a couple of magnitude Wah/g where h is the distance of the center of gravity above the frame. This couple is represented by a uniform positive load applied over half the beam, with an equal uniform negative load over the other half. An expression for the moment in the beam at any point in its longest span is then set up, and from it the maximum moment in this case determined. It is shown also that the results are practically the same if the couple is represented by a triangular positive load over half the beam, combined with an equal triangular negative load over the other half.

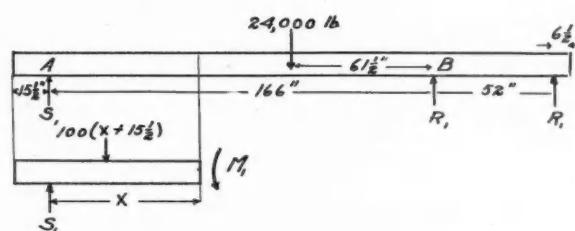


Fig. 1

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²Engineer in charge of trailers, Mack Trucks, International Motor Corp.

Load, Acceleration and

Stresses due to oscillation of the springs are computed on the assumption that the trailer is a uniformly loaded beam oscillating about an axis in it and perpendicular to it directly over the axle and that we have the case where the rear springs are at rest while the front ones have been compressed to twice their deflection under dead load. This means that the reaction at the front of the trailer will at this instant have twice its known static value, S_1 . Thus the beam is in a dynamic state, having an angular acceleration which can be determined in terms of S_1 . The motion of a portion of the beam of variable length is analyzed as being produced by the force $2S_1$, its loaded weight, the moment at the terminating section and the shear at that point. From this analysis a general expression for the moment in the longest span of the beam is determined, and from it the maximum moment in the case of such an oscillation.

A combination of the stresses found for dead load, accelerated motion and oscillation gives a predictable total stress on the frame. A study of the distribution of these stresses may indicate a possible design requiring less weight than that in use. In order to illustrate the methods of approach as here outlined we will now give the solution in a particular case.

A Practical Example

A truck consists of a hauling unit and a trailer which carries the pay load. The trailer is 20 ft. long and designed to carry a 12 ton pay load, with the center of gravity not more than 36 in. above the side members supporting the trailer and at the center of the length. The 20 ft. side members are supported by the hauling unit at a point $15\frac{1}{2}$ in. from the front of the trailer and at the ends of 52 in. leaf springs set symmetrically over the trailer axle which is $32\frac{1}{2}$ in. from the rear end. The greatest braking effort is sufficient to cause a retardation of 16 ft. per second per second in the truck, while the greatest friction force on the rear tires is 6000 lb. The axle height is 20 in. It is required to determine predictable stresses in the two side members, each of which has a section modulus of 15 in. cube.

The computation is made upon the assumption that the side members of the trailer combined may be looked upon as a beam uniformly loaded (100 lb. per in.) over its entire length with the pay load. This assumes, in addition to equal distribution of pay load, that the body of the trailer is so constructed that effects due to its weight may be considered as confined to the body, or that stresses in the side members may be considered as due to pay load only.

Stresses Due to Dead Load

Let Fig. 1 represent the circumstances in this case; S_1 being the reaction at the front support, A and R_1

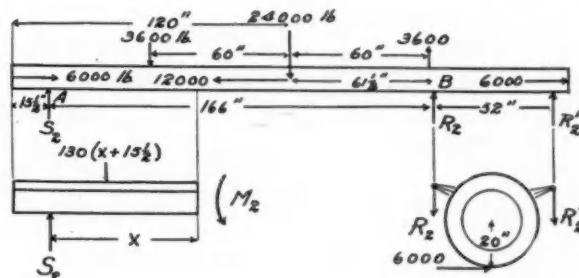


Fig. 2

the reaction at the ends of the springs. These reactions are equal, since there is no moment around the rear axle. Now we have

$$2R_1 + S_1 = 24,000,$$

and taking moments about B , the front end of the springs, we get

$$166 S_1 = 24,000 (61.5) + 52 R_1.$$

These two equations give

$$S_1 = 10,938 \text{ lb. and } R_1 = 6531 \text{ lb.}$$

Consider now a section of the beam extending from the front to a distance x back of A , the front support. It is held in equilibrium by the force S_1 and a moment M_1 at the right end. Taking moments about this end we have

$$S_1 x = M_1 + 50 (x + 15.5)^2;$$

whence

$$M_1 = 10,938 x - 50 (x + 15.5)^2$$

gives the moment at any point in the long span between the front support and the spring. Setting $dM/dx = 0$ we find this moment greatest where $x = 93.88$ in., at which point its value is $M'_1 = 428,660$ lb.-in. Since the section modulus for the combined side members is 30, the maximum stress S_1 , due to dead load is $S_1 = 428,660/30 = 14,288$ lb. per sq. in.

Stresses Due to Braking

The braking force necessary to produce a retardation of 16 ft. per sec. per sec. in a mass of 12 tons is 12,000 lb. Since the largest force the rear brakes can bring into play is 6000 lb., there exists a backward force of $12,000 - 6000 = 6000$ lb. exerted by the hauling unit on the trailer. To reduce this problem in dynamics to one in statics we insert at the center of gravity of the pay load a forward force equal to the

mass of the load times its acceleration or $(24,000)(16)/32 = 12,000$ lb. This force 36 in. above the center of our hypothetical beam is equivalent to a forward force of 12,000 lb. at the center of the beam combined with a counter-clockwise couple of magnitude $(12,000) 36 = 432,000$ lb.-in. We assume that this couple is equivalent to a uniform positive load of 30 lb. per in. over the front half of the beam and a negative load of 30 lb. per in. over the rear half. These are reducible to a downward force of 3600 lb., 60 in. in front of the center of the beam and an upward force of 3600 lb., 60 in. behind the center. We now have the beam acted upon by forces as shown in Fig. 2.

In this case we have

$$R'_2 + R_2 + S_2 = 24,000,$$

and taking moments about the rear axle

$$26(R'_2 - R_2) = 6000(20) = 120,000.$$

From moments about *B*, the front end of the springs, we get

$$S_2(166) = 3600(120) + 2400(61.5) + R'_2(52).$$

These three equations give

$$S_2 = 13,812 \text{ lb.}, R'_2 = 7402 \text{ lb.}, R_2 = 2787 \text{ lb.}$$

Consider now a section of the beam extending from the front to distance *x* back of *A*, the front support. It is held in equilibrium by the force *S*₂ and a moment *M*₂ at the right end. Taking moments about this end we have

$$S_2x = M_2 + 65(x + 15.5)^2$$

As before, we find from this that *M*₂ is a maximum where *x* = 90.75 in., at which point its value is *M*₂' = 519,394 lb.-in. The corresponding stress due to dead load and braking effect is *s*₂ = 519,394/30 = 17,313 lb./sq. in. Since the maximum stress *s*, due to dead load is 14,288 lb./sq. in., the braking effect increases the maximum stress about 3000 lb./sq. in.

It is probably more correct to represent the 432,000 lb.-in. couple by a triangular load varying from plus 45 lb. per in. at the front end of the beam to minus 45 lb. per in. at the rear end. However, to make this assumption increases very considerably the difficulty of finding the general moment in the long span *AB*. The result is a maximum moment of 511,170 lb.-in. at a distance of 95.8 in. from the front support. The corresponding maximum stress is 17,039 lb. per sq. in. This differs so little from the stress found by the simpler method that the complicated computation does not seem justified especially since the error is on the side of safety.

Stresses Due to Oscillation

In order to compute stresses due to oscillation or bump load we assume that the trailer is represented by a uniformly loaded beam (100 lb. per in.) oscillating about an axis perpendicular to the beam at point *O*, in it, directly over the axle and that the state of the motion is that in which the front springs have reached their greatest deflection (taken as twice static dead load deflection) and the front support reaction is *2S*₁ or twice its dead load value. Letting the angular acceleration of the beam be *a*, we then have a

state of acceleration produced by forces as shown in Fig. 3.

Taking moments about *O* for the whole beam we have

$$2S_1(192) - 24,000(87.5) = \frac{24,000}{g} \left[(240)^2/12 + (87.5)^2 \right] a$$

Using the value *S*₁ = 10,938 found before we get

$$a = g/142.4$$

Next consider a section of the beam of length *2y* measured from the front end. Its center of gravity will move with an upward acceleration $(207.5 - y)$ a and an angular acceleration *a* under the influence of the force *2S*₁, the shear *F*, and the moment *M*₃. For the upward motion we have

$$2S_1 - 200y - F = \frac{200y}{g} (207.5 - y) a.$$

Taking moments about the left end of the section we get

$$2S_1(y - 15.5) + Fy - M_3 = \frac{200y}{g} \frac{y^2}{3} a.$$

Elimination of *F* from these equations and the substitution of the values of *S*₁ and *a* lead to the equation

$$M_3 = 0.9363y^3 - 491.43y^2 + 43,572y - 339,078.$$

Setting $dM_3/dy = 0$ we find *M*₃ is a maximum where *y* = 52.3 in.; that is, at 104.6 in. from the front end or *x* = 89.1 in. from the front support, *A*. This value

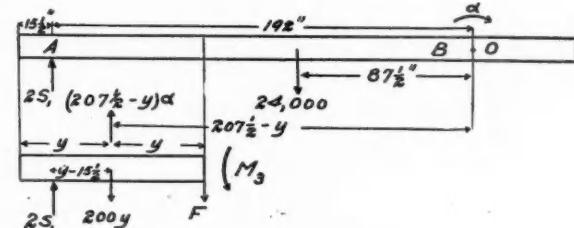


Fig. 3

of *y* gives for the maximum moment *M*₃' = 738,000 lb.-in. and a corresponding stress *s*₃ = 24,600 lb./sq. in.

Since the stress for dead load alone is *s*₁ = 14,288 lb./sq. in., it is seen that a bump causing double deflection of the springs compared to static deflection increases the stress by over 10,000 lb./sq. in. Again, since the stress can be further increased 3000 lb./sq. in. by braking, a combination of all the effects, pay load, brake load and bump load, simultaneously, gives a predictable maximum stress of 27,600 lb./sq. in.

The pay load stress may be increased by a factor depending upon the stiffness of the cross members and their connections, if one wheel of the trailer is backed on to the curb and the other not. In ordinary service this will not occur simultaneously with the other extraordinary loads. So, since the pay load, at

worst, in this case, would not more than double the load on one side member, the predictable stress would be less than $2s_1$, that is less than 28,576 lb./sq. in. Hence we may expect a condition little, if any, worse than that under the three loads considered.

It is instructive to compare the contributions to the total moment in the long span AB made by the pay load, brake load and bump load. Let the moments due to these loads be respectively M_p , M_b , and M_o . Then

$$\begin{aligned} M_p &= M_1 = 50x^2 + 9388x - 12,013, \\ M_b &= M_2 - M_1 = -15x^2 + 2409x - 3603; \end{aligned}$$

to which must be added $30(x - 104.5)^2$ for values of x greater than 104.5 in., and

$$M_o = M_3 - M_1 = 0.117x^3 - 67.5x^2 + 8762x - 17,059^1.$$

The total moment under the simultaneous action of all three loads is

$$M = M_p + M_b + M_o = 0.117x^3 - 132.5x^2 + 20,559x - 32,675.$$

This moment is a maximum where $x = 87.8$, and its maximum value is $M' = 806,300$, with a corresponding stress of 26,880 lb. per sq. in. which is, of course, slightly less than the sum, 27,600 lb. per sq. in., of the individual maximum stresses previously found. It is seen from Fig. 4 that stresses resulting from a bump that doubles the spring deflection are nearly as great as those due to dead load alone and might be considerably greater if the bump is severe enough to more than double the static deflection.

The curve of total moment indicates that the side members of the trailer might be considerably lighter towards the front end without increase in stress in the material. Using the relation $s = M/f$ we find that for a constant maximum stress the section

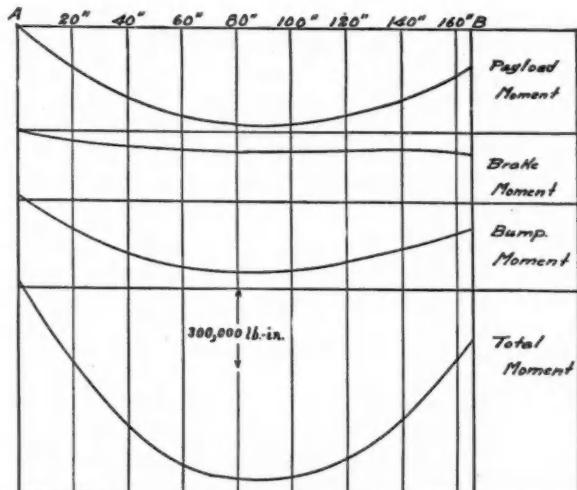


Fig. 4

modulus, $f = M/s$, varies directly with the moment. Hence, a side member with section modulus varying directly as the ordinate of the lower curve in Fig. 4 would be subject to constant maximum fiber stress due to bending moment. Again, constant stress dis-

¹To obtain this form we must transform the previous value of M_3 by the relation $2y = x + 15.5$.

tribution would lead to uniform fatigue conditions. In designing a side member on this basis it would be necessary to keep in mind also stresses due to shear.

The total moment curve in Fig. 4 also indicates in what range reinforcement can best be added to the side members. In case a member of variable section modulus is built up a stress curve may be plotted from the relation $s = M/f$, from this curve the weakest range can be found and necessary reinforcement determined.

Engineering Ideas Will Win Automotive Supremacy in 1932

(Continued from page 345)

are well equipped, in other words, with the sinews of war.

To carry on, however, each one of this group feels that it must emerge as one of the relatively few "big ones."

Consequently, we will see in 1932 definite attempts by several makers to get for themselves new places in the sun. Large companies, we predict, will be found entering new price classes, usually lower than the one in which so far they have been operating. All along the competitive battle line, the big, integrated units already established will find themselves faced with new competition from old-established makers, and the battle will be engaged over the entire front.

Next year will be momentous in the lives of many automotive parts, accessory and vehicle companies. It will see an unusual activity in the development of better manufacturing methods, higher quality workmanship, even further production economies, and vigorous merchandising activity. It will be a glorious year for fighters, and a good one for the industry as a whole, for the increased competition of which we have spoken will take place in a market gradually recovering from depression and holding definitely larger possibilities for both production and profit than have either 1930 or 1931.

At least, that's how the picture looks to us.

Shale Oil Faces Extinction

It is reported from Scotland that the shale oil industry of that country faces extinction. A request for Government assistance was made but was refused. The Minister of Mines, in a talk at Bathgate, explained that a direct subsidy was impossible because of the state of the national finances, and any such grant would raise the question of assistance to other depressed industries. A suggestion that oil refined at Uphall be exempted from excise duty was impractical, owing to the difficulty of limiting preference to one refinery. He also pointed out that the Admiralty at present purchased fuel oil at 30 shillings per ton, while shale oil would cost about £6 per ton and if the Navy were to use shale oil it would be necessary to increase the estimates by half a million pounds sterling a year. It is stated that the shale industry, which has been threatened with extinction for a number of years, employs about 2000 men at present.

For the Business Bookshelf

Electrical Equipment of the Motor Vehicle, Part III, Current-Consuming Devices

Die Elektrische Ausrustung des Kraftfahrzeuges, Teil III, Stromverbraucher, by Dr. Friedrich Trautmann. Published by M. Krayn, Berlin.

THIS is the final volume of a three-volume set on electrical equipment for automobiles and deals with the various current-consuming devices, from electric headlamps to cigar lighters. More than a hundred pages are devoted to the subject of lighting equipment, and the problems of motor vehicle lighting are discussed from every angle, with the aid of numerous illustrations. This chapter is concluded with a reprint of recent amendments on vehicle lighting of the German motor vehicle law.

A nearly equally important chapter is devoted to starters. The whole subject, of course, is dealt with from the technical standpoint, and in the chapter on Starters we find diagrams of the variation of cranking torque of a single cylinder during successive strokes, a diagram of the mean cranking torque of four- and six-cylinder engines in relation to the piston displacement, a diagram of the cranking torque of a six-cylinder engine at different atmospheric temperatures, as a function of the cranking speed, etc.

The following chapters deal with audible signals (electric horns), visible signals (stop lights and turn indicators), windshield wipers, electric brakes, electric fuel pumps, electric tank gages, electric heaters and cigar lighters, measuring instruments, and cables, switches, fuses, etc.

This is probably the first book dealing exclusively with current-consuming devices for use on motor vehicles and should be of interest to engineers engaged in the electrical equipment industry. It is profusely illustrated, but the scale of most of the line drawings is rather small and the lettering on some of them is so small that it can be read only with a reading glass.

Design and Calculation of Modern Automobile and Motorcycle Engine

Konstruktion und Berechnung Moderner Automobil-und Kraftrad-Motoren, by Carl Riedl. Second edition. Published by Richard Carl Schmidt & Co., Berlin.

THIS is a second edition of a volume dealing with the automobile and motorcycle engine from the standpoint of the designer. It is notable for its large number of clear line and halftone illustrations. The first several chapters are devoted to a general discussion of engine theory, the efficiency of internal combustion engines, calculation of their output, characteristics of high-speed engines, indicators and indicator diagrams, effects of compression, stroke/bore ratio, etc. Each of the major components of the engine is then dealt with separately. Various forms are illustrated and described, and rules for the calculation of the part are given.

A section somewhat out of harmony with the rest of the work is that dealing with sleeve and rotary valve engines, in which are described and illustrated

a large number of engines of these types, of which most never got beyond the patent office stage. Since rotary-valve engines have never played a part in automobile and motorcycle engineering, and the vogue of sleeve-valve engines has ebbed off considerably, this section can hardly be of much interest to the practical designer. There is, however, still considerable interest in these engines among inventors, and it may have been for the benefit of the latter that this extensive treatment was included. Considerable space is devoted also to the subject of supercharging. The thoroughness of the work under review may be judged from the fact that it contains nearly 800 6 1/2 x 9 3/4 in. pages, 798 text illustrations and 13 tables.

Cam Design for Production Machines

Zur Konstruktion von Kurvenscheiben bei Verarbeitungs-maschinen, by Dr.-Ing. Karl Alexander Flocke. Published by VDI Verlag, Berlin NW-7, Germany.

THIS is one of the series of research pamphlets issued periodically by the German Society of Engineers. The author distinguishes between three arrangements of the cam and the cam follower, which latter he considers to be of the roller type. The roller may be carried at the end of a tappet whose axis intersects the cam axis; it may be carried on a tappet whose axis is offset from the cam axis, and it may be carried at the end of a rocker lever. It is stated that the angle between a tangent to the cam surface at the point of contact and the direction of motion of the roller, which must not drop below a certain minimum value, is of great importance. In conventional design the cam is laid out without regard to this angle and is then checked as to whether the angle is within permissible limits, while by the method followed by the author of this treatise the angle is considered from the very beginning.

German Facts and Figures

UNDER the name of "Tatsachen und Zahlen aus der Kraftfahrzeugindustrie 1930" the German Automobile Makers Association has again published the German Facts and Figures, which have once more been augmented and contain a wealth of valuable statistical information relative to production, registrations, imports, exports, operation of motor transport concerns both private and public, taxation, etc. This year well-illustrated technical statistics showing the tendency in German automotive engineering, and tables giving complete technical details of all German car, truck and bus models as well as numerous foreign vehicles on the German market have been added. The publisher again is the Dr. Ernst Valentin Verlag of Berlin-Friedenau I, Sponholzstr. 7. The book is offered at 3.50 marks, exclusive of postage.



PRODUCTION LINES

Always a Welding Man

We are indebted to "The Danly Guide Post," Vol. 1, No. 1, house organ of the Danly Machine Specialties, Inc., for this one.

"A man was discovered by his wife one night standing over his baby in its new crib. She silently watched him. As he stood looking down at the sleeping infant, she saw in his face a mixture of emotions—doubt, despair, incredulity. Touched and wondering alike at this unusual parental attitude and the conflicting emotions, the wife with eyes glistening arose and slipped her arms around him.

"'A penny for your thoughts,' she said, in a voice tremulous with tenderness.

Startled into consciousness, he blurted them out: 'For the life of me, I can't see why anybody should make a crib like that when it could be made so much better and cheaper by spot welding!'"

Practice Stands

Memorandum SP-1498 just received from the Department of Commerce reaffirms simplified practice recommendation No. 51 dealing with Die Chasers. Accordingly the existing schedule will continue without change for the rest of the year.

Can You Use One?

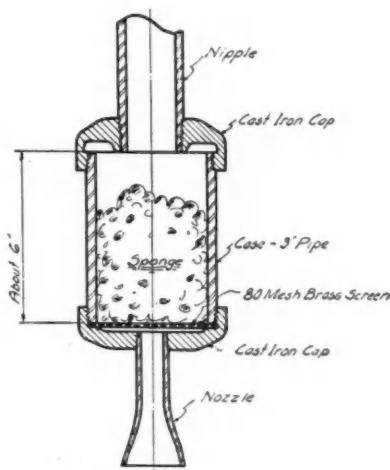
A discussion of recent progress in roll grinding brings to light one of the best grinding "kinks" we have seen in a long time. *Grits and Grinds*, for July, 1931, gives this example of Norton Company practice. Fine finish in grinding is dependent on many variables. One of the most troublesome is that of clean coolant. Here is the descrip-

Some Speed

Milling brake parts on an Osterlein Offset Miller at the rate of 955 pieces per hour. The fixture has automatic clamp and release work holders at one elevation for truck brake parts, alternating with others at another elevation for passenger car parts. Both sets of work holders can be used simultaneously, or they can be used individually, but in either case production is limited to what an operator can handle, which, in the instance illustrated, is approximately 950 parts per hour

tion of a simple attachment made by Norton:

"Trouble from scratches caused by foreign matter in the coolant has been eliminated by the use of a filter located at a point close to the nozzle. A common and inexpensive type found to be very efficient is made by Norton Company in the form of a cylinder which can be



filled with a common fine sea sponge a little larger than the container. When an accumulation of foreign matter causes the flow of coolant to become insufficient, it is only necessary to unscrew the cap, remove the sponge, rinse it thoroughly and replace it in the filter."

Which leads us to ask why not use this filter on the many grinding jobs where finish is so important? For instance, camshaft and crank-shaft bearings, pump shafts, and the host of others.

Growing Fast

From rather humble beginnings, broaching is assuming a new importance in machine shop practice. Not so long ago broaching was limited to the cutting of keyways, splines, and some geometrically shaped holes. New uses now come by leaps and bounds. Broaching has been applied successfully to external operations, finishing the sides of gears, cutting gear teeth, forming ratchets and many others. Small internal gears also may be broached.

Salvage Them

Practical advice about salvaging worn grinding wheels comes from *Tool Tips*, August, 1931.

"A grinding wheel that has been worn down until it is not suitable on a certain type grinder may still have additional life on another type of machine.

"This is a function of the tool crib that can be easily met by requiring each workman to return the discarded grinding wheel to the crib when requisitioning a new wheel. Wheels that can be used on smaller machines for other applications are placed in the proper stock. Those that can not be salvaged should be destroyed by the crib attendant."—J.G.





The electrically heated pit-type furnace for annealing high-speed and super high-speed steel. A nickel chromium vertical crucible, 17 $\frac{1}{4}$ in. diameter by 35 $\frac{1}{2}$ in. deep, is used in place of the customary horizontal muffle. Samples of the preceding charge are shown around the base of the furnace. On the insulated plug are shown bars of super high-speed steel, and several lumps of coke of the size used in the crucible. The furnace has a capacity of 30 kw. The operating temperature is 900 deg. C., or 1652 deg. Fahr.

Annealing is the Operation

By Wirt S. Scott

Special Representative Westinghouse Electric & Manufacturing Co.

charge of steel under heating and cooling confirmed this.

The stock, before being annealed, was forged either into bar stock, or directly into tools, which consequently left some scale on the surface. The bar stock or tools were anywhere from 12 in. to 24 in. long.

In designing the crucible-type electric furnace for this application, no thought was given at the time to abandoning the use of the mica dust, as that was considered by the heat treaters as an essential part of the process.

With the pit-type electric furnace as supplied, having a vertical crucible made of cast nickel chromium alloy 17 $\frac{1}{4}$ in. diameter x 35 $\frac{1}{2}$ in. deep, and a sand-sealed door, the opportunity was presented for experimenting with gas as a non-oxidizing agent, rather than using the mica dust. Charcoal was first used, but was found to burn up too rapidly. Coke, free of sulphur, was then tried and found to be 100 per cent successful. One-quarter of a peck, placed in the furnace, would last about a week.

A remarkable thing brought out, which is very noticeable, is that there appears to be even less scale on the work after it comes out than when it goes in the furnace. Whatever scale is on the steel is very flaky, and will brush off with the hand.

With the gas furnace, 60 hr. were required to get out a heat: 12 hr. heating and 48 hr. cooling. With the electric furnace a heat is being obtained in exactly 24 hr., 7 hr. heating and 17 hr. cooling.

Four test samples were taken out of the charge, selected at random, and given a Brinnell test. These tests were as follows:

No. 1	228
No. 2	241
No. 3	256
No. 4	256

HIgh-SPEED and super high-speed steels, after forging, are full of terrific strains and stresses. If these are not thoroughly removed before the hardening and tempering operation, additional stresses will be set up in the steel which may cause the tool to break at any time. In fact, sufficient stresses may be set up to cause the tool, literally, to explode. The annealing operation, by far, is the most important heat-treating operation of high-speed and super high-speed steels.

Where the forged stock is in relatively short lengths, it is the practice to accomplish the annealing in a muffle, packing mica dust around the steel so as to exclude all air and thereby prevent oxidation. The mica dust is also supposed to give a uniformly slow cooling for the proper anneal.

In a manufacturing plant where a considerable quantity of such steels were worked up into tools to be used in the production equipment, an investigation was made to locate the cause of trouble being experienced in the breakage of such tools. The investigation showed that it probably was due to the annealing. Temperature exploration tests of the

Most Important Heat-Treating of High-Speed Tool Steels

From the tests mentioned it is evident that the high-speed steel was dead soft and thoroughly annealed.

While the furnace has not been in use long enough to obtain accurate data as to its effect on the life of the tools, as it undoubtedly will show in course of time, there are positive indications that the steel is in a better condition for hardening. Since using the electric furnace, the hack-saw blades withstand three times as much cutting as they formerly would stand before having to be resharpened. In addition, the steel is much more easily and quickly cut.

The electric furnace supplied for this application is equipped with two thermocouples and a two-point recording and controlling pyrometer. One thermocouple, of the protected-tube type, extends through the top of the furnace and is of sufficient length to reach down into the center of the charge; the other thermocouple extends through the side of the furnace, where it is influenced directly by the temperature of the heating elements.

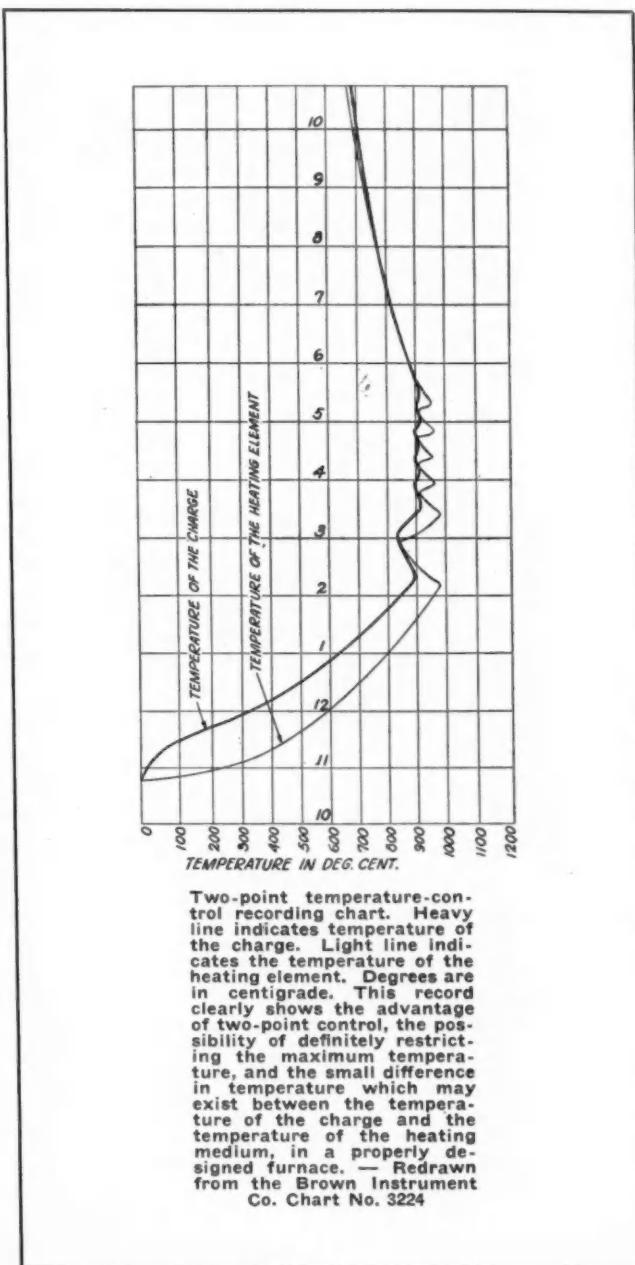
The temperature-control chart clearly indicates the functioning of these couples and the pyrometer. The charge is heat treated at 900 deg. C. (1652 deg. Fahr.), hence the instrument is set to control the charge at that temperature. The limiting temperature on the heating element is fixed by the pyrometer setting at 980 deg. C. (1796 deg. Fahr.). On heating up, the temperature of the heating element reaches 980 deg. before the work reaches 900 deg., hence the pyrometer causes the control to cut off the current. The charge continues to heat up for a short period of time after the current is off, and when the current comes on again there is only a small temperature differential between the charge and heating element. After one more cutting off by the temperature of the heating element, the temperature of the charge has reached 900 deg. C., and from that time on the temperature of the charge controls the cutting on and off of the current, the charge being held within 7 deg. C., while the maximum temperature of the heating element becomes 960 deg. C. In other words, at operating temperature, the temperature of the heating element is only 60 deg. C. above the temperature of the work.

After the charge reaches 900 deg. C., it is held at that temperature for two hours, and the current cut off. When the charge has cooled to 400 deg. C. (752 deg. Fahr.), it may be removed from the furnace.

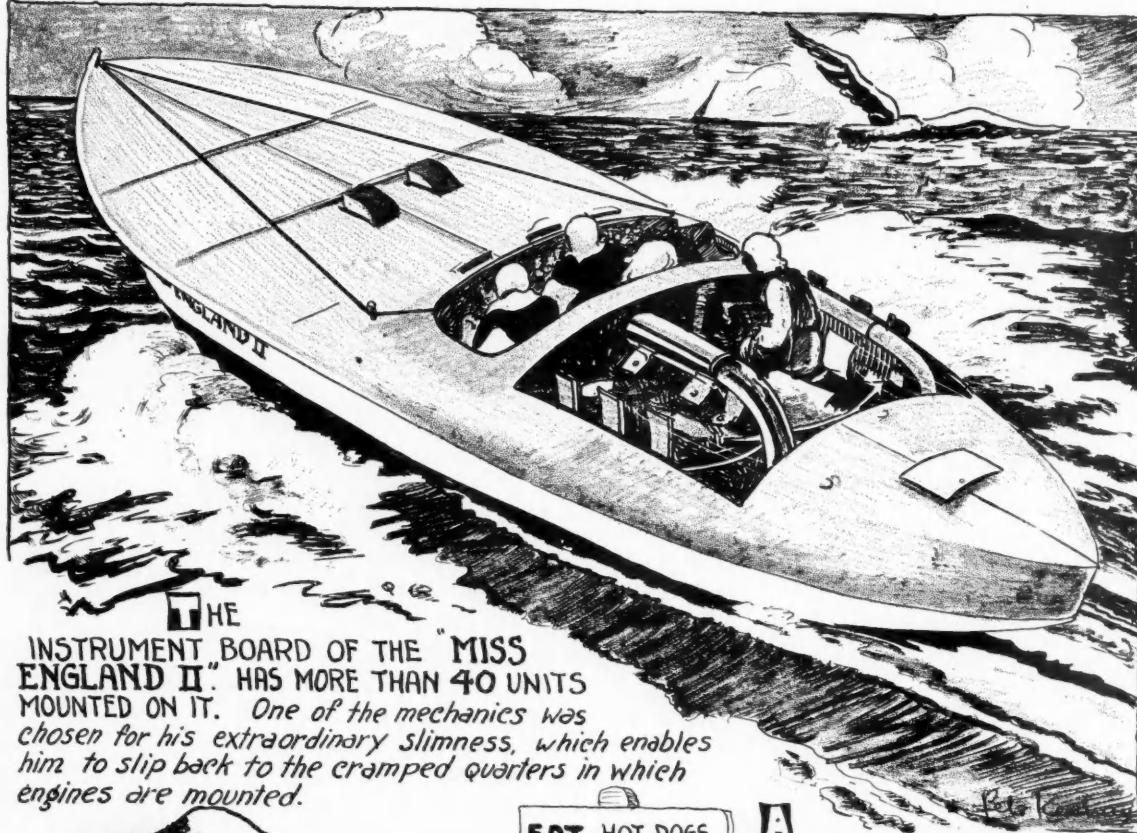
Three hundred and fifty pounds of high-speed and super high-speed steel are heat treated at a time. This steel costs anywhere from \$1.50 to \$2.50 per lb.

At the time the temperature graphic chart shown was produced, there were annealed 400 lb. of steel, with a power consumption of 135 kw. hr. This gave

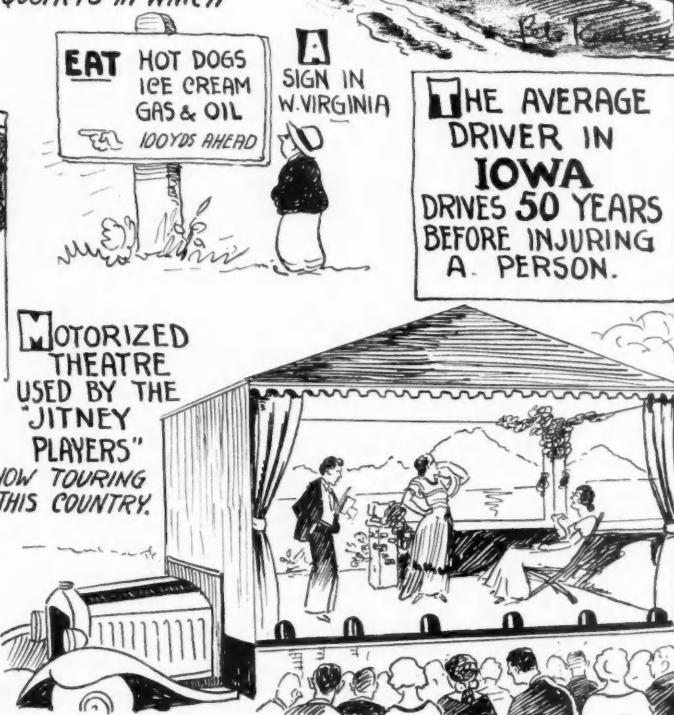
a production of 3 lb. of steel per kw. hour consumed, an altogether negligible cost in comparison to the value of the steel and the results being obtained.



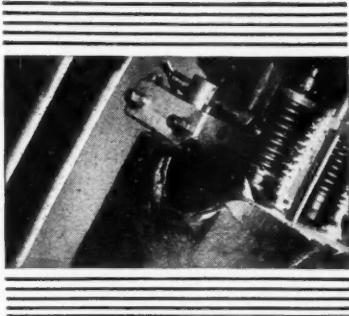
Automotive Oddities—By Pete Keenan



COLONEL HUBERT JULIAN. ONLY NEGRO IN U.S.A. TO BE GRANTED A PILOT'S LICENSE BY THE DEPT. OF COMMERCE.



Correspondence about "Automotive Oddities" is invited. Contributions used will receive editorial mention when practicable. If you are interested in the source of, or the reason for, a particular "Oddity," ask the editorial department of *Automotive Industries* about it.



NEWS OF THE INDUSTRY



Plymouth Leads In Wayne Again

Registers 847 Cars in County in August

DETROIT, Sept. 3—For the second successive month Wayne County registrations for August show Plymouth in the lead with 847 cars. Ford is second with 550 and Chevrolet third with 507, the latter being ahead of August, 1930. For that month Ford registered 1668. Auburn, Hupp, Lincoln, Oldsmobile, Willys, Pontiac and Graham also show gains in registrations over last August. The total registrations for the month were 2678 compared with 3209 last year, the difference being more than accounted for by the decrease in Ford registrations. Aside from Ford the industry showed a net gain of 578 cars, largely due to the showing of Plymouth.

Chevrolet Produces 54,958 in August

DETROIT, Sept. 1—Production of Chevrolet cars and trucks in August totaled 54,958 units as compared with 51,622 in the same month of 1930, according to an announcement by W. S. Knudsen, president and general manager. This marks the fourth successive month this year during which Chevrole has shown a gain over the corresponding month of 1931, and brings this year's total to 643,410 cars and trucks for the first eight months. Current employment at Chevrolet approximates 33,000. Exports during August totaled 3973 units.

Fixes Truck Rates

COLUMBIA, S. C., Sept. 2—The state railroad commission has fixed motor freight rates for regular truck lines at 10 per cent in excess of rail rates for the same distances in all classifications, effective Oct. 1. Hearings in connection with the establishment of uniform motor freight rates have been held frequently since 1928.

BLACK, as a color for finishing automobile bodies still continues its lead over blue, according to the current issue of the Automobile Color Index, issued by Duco. The lead is steadily declining, a trend analysis shows, but it's still a fat one for all that.*** The Ford Motor Co., aviation division, has shipped to England what is just about the last word in de luxe cabin airplanes . . . it's a Ford tri-engined unit. The cabin is decorated with prints of English hunting scenes, and there are reclining chairs upholstered in dark green grain leather*** British motorists are being offered a compass as an extra dashboard gadget*** Eight B. F. Goodrich employees got 20-year service pins this month*** the municipality of Barranguilla, Colombia, imposes a tax of one cent on each passenger carried by bus. You buy a bus ticket and also a tax ticket. Somewhere along the line a gov't bandit (Colombian for official) climbs on board and collects the tax ticket*** It was only a few weeks ago that free wheeling was recognized by the Dodge factory. Sometime before the event, a Dodge dealer in Philadelphia decided to take advantage of all the publicity that was floating around, so he took the left front wheel from one of his brand new chassis, anchored the axle to the frame on that side and drove the car around the streets advertising, with lotsa ballyhoo (no advt.) "Dodge Three-Wheeling," with subsidiary sales talk on how "three-wheeling" proved the strength and rigidity of the Dodge chassis. It was a good stunt and attracted a lot of attention in our little village. There are, be it noted, some cars on which "three-wheeling" of the sort, might prove disastrous. Names of cars not furnished on request*** Georgia Tech and Leland Stanford universities recently received a show chassis from Chrysler*** Robert F. Logan, Evans-ton, Ill., cranked his car while in gear and when it moved toward him turned and fled in front of the car, it following. After nearly a block Logan tripped and fell and the car ran over him. He was taken to the Community hospital.*** Firestone Tire and Rubber Company announces completion of plans for the immediate erection of a \$350,000 Chicago branch office and service building on its holdings at Sixteenth street and Wabash avenue. Decision to go ahead with the work now, J. A. Calderhead reveals, was prompted by a desire to cooperate with Mayor Cermak who has urged speeding of all prospective projects to relieve unemployment.*** In a little room off Piccadilly, London, is a very queer museum. The exhibits include a crumpled horn (cow), and a crumpled horn (deer), stuffed pheasants, partridge, a duck from Regent's Park, and a swan, horse-shoes, stones, and a selection of golf balls. The "curator" of the museum is Mr. Reginald Delpech, Sales Director of Triplex Safety Glass, Ltd.—H.H.

THE
NEWS
TRAILER

July Car Sales Revise Trend

Usual Seasonal Increase Not Effective

PHILADELPHIA, Sept. 3—July registrations of new passenger cars in the United States totaled 194,322 against 201,911 in June and 254,098 in July, 1930. The loss from June amounted to 3.6 per cent and from last year to 23.5 per cent. Normally July shows a small seasonal increase over June, but the failure to follow the usual trend this year possibly may be attributed to the fact that several important makers which for a number of years past have announced new models in July, did not do so this year.

For the first seven months the registration total was 1,371,452, as compared with 1,907,617 in the corresponding period last year, a loss of 28 per cent.

Chevrolet again led the pack in July with a total of 58,592. Ford was second with 50,361. Plymouth jumped to third place with a final figure of 14,599 compared with 3896 in June and 8089 in July, 1930.

De Soto Staff Increased

DETROIT, Sept. 3—Thirty-five new field representatives have been added to the district sales staff of the De Soto Motor Corp. as the result of the splitting of field territories into smaller units. Since June 1 317 dealers have been added to the De Soto organization, these dealers also handling the new Plymouth.

Dodge Sales Up

DETROIT, Sept. 3—Dodge registrations for the week ending Aug. 22 showed an increase of 29.3 per cent over the corresponding week of 1930, this being the seventh consecutive week to show a gain over 1930. Dodge truck deliveries showed an increase of 22.2 per cent for the period.

Southwestern Railroads File Tariff for Freight Delivery Service

By G. Lloyd Wilson

PHILADELPHIA, Sept. 2.—One of the most significant moves in the battle between trucks and rails is seen in the announcement that after a dozen years of consideration, experiment and discussion, the railroads comprising the Southwestern Lines have filed with the Interstate Commerce Commission a tariff governing the pick-up and delivery freight service in the section of the United States west of the Mississippi, south of a line drawn roughly through St. Louis and Kansas City, Mo., and east of the Rocky Mountains. The tariff and traffic officers of the Southwestern Lines have been working many months on the details of the arrangements.

Contingent upon the acceptance of this tariff by the I.C.C., a territorial group of important rail lines will be able to offer a complete transportation service on less than carload lots of freight, from the factory door to that of the consignee. Previous attempts to accomplish this result have been attempted only by single rail lines, or by agreement between small intraterritorial groups.

The rail lines will thus attempt to offer the same flexible type of hauling service now offered by contract motor carriers, in some cases with no addition to the existing rail rate.

In March, 1931, a group of Southwestern railroads, headed by the Missouri-Pacific, the St. Louis-San Francisco, the St. Louis-Southwestern, the Missouri-Kansas-Texas, the Santa Fe, the Louisiana and Arkansas and others, filed with the Southwestern Freight Bureau their intention of proceeding with the publication of tariffs providing for the pick-up and delivery of less than carload merchandise freight in order to meet motor truck competition. Conferences were held with various railroads through the Southwestern Lines Freight Tariff Association. The plan did not meet with the unanimous approval of the carriers, but the lines mentioned above appointed a working committee to proceed with the task of drawing up the rules, regulations, rates and allowances pertaining to the proposed service.

The actual tariffs prepared by the working committee have been filed by J. E. Johanson, the agent of Southwestern Freight Bureau, with the Interstate Commerce Commission to become effective on Oct. 1, 1931. About 75 large and small railroads are participating carriers in the tariff. This number includes a dozen or more major Southwestern railroad systems.

The store-door service set-up by this first major territorial railroad store-door freight plan includes calling for and collecting the freight, issuing receipts for it at the docks, platforms, doorways directly accessible to trucks at the shippers' warehouses, factories, stores or places of business and transporting the freight in motor vehicles.

No charges are made by the railroads for the pick-up or delivery services if the freight moves at railroad rates in excess of certain minimum rates. These minimum rates vary according to the origin and destination of the traffic. When the railroad class rates are less than 48c first class, 41c second class, 34c third class and 26c fourth class, additional charges for store-door pick-up or delivery service are added. The amount added for pick-up or delivery varies with the rates paid. If the first class railroad rates are less than 38c per one hundred pounds, the trucking charge for pick-up or delivery is 10c per one hundred pounds, first class, and correspondingly lower charges are assessed for classes lower than first class. If the first class rates are between 38c and 42c per hundred pounds, the pick-up or delivery charge is 6c per hundredweight, first class. If between 42c and 48c the charges for pick-up or delivery service are 2c per hundred pounds, as shown by the following table:

Railroad Freight	100 Lb. 100 Lb. Rates per	100 Lb. Western Classification Classes 1 2 3 4
38c and less	10 9 7 4	
42c and over 38c	6 5 5 3	
46c and over 42c	2 2 2 1	

Lower extra cartage charges are assessed upon shipments of cotton piece goods and other freight shipped under commodity rates or exceptions to the western classification.

Additional charges at the rate of 10c per one hundred pounds are assessed for the pick-up or delivery services rendered by the carriers in connection with freight which moves upon the basis of the joint rail-and-water freight rates applicable via the Federal Barge Line, the Mississippi Valley Barge Line Company or other barge line companies.

Allowances at the rate of 5c per one hundred pounds are paid to the shippers which is entitled to free pick-up service is delivered by the shippers to the railroad freight stations. Payment of these allowances is made within 30 days after the shippers file claims for refund supported by itemized statements listing the shipments covered by the claims. The shippers must file also a certificate that the shipments would have been entitled to pick-up service under the provisions of the Southwestern Lines tariff. The claims must include all shipments upon which allowances are claimed during the same calendar month and they must be filed with the carriers from whom the allowances are due

within 45 days after the last day of each calendar month during which the shipments are made.

Railroads heretofore have not undertaken to collect the amounts of the invoices covering the goods shipped and remit the amounts collected to the shippers. This service has, however, been rendered for many years by the railway express companies and by motor freight carriers.

The Southwestern Lines made another innovation in freight service by establishing a C.O.D. service in connection with all shipments eligible to receive pick-up and delivery services if requested by the shippers and if the additional C.O.D. charges are paid. These charges for collecting and remitting the invoice amounts range from 30c upon collections of \$5.00 or less to \$3.25 upon collections of \$1,000. Amounts over \$1,000 are collected and remitted at the rate of \$3.25 per \$1,000.

Hercules Reports Profit

CANTON, OHIO, Sept. 1.—Net earnings of the Hercules Motor Corp. for the first six months of 1931 totaled \$233,371, according to announcement of officials of the company. The figure was reached after Federal tax and other deductions had been made.

Net earnings for the first quarter were reported as \$121,180 and for the second quarter \$112,190. Plant officials also announced the receipt of another sizable order for Russia, production on which already has been started.

Swiss Tariff Modified

WASHINGTON, Sept. 3.—Refund of two-fifths of the duty paid on imported passenger automobile chassis, after completion of the coachwork in Switzerland, is provided by a measure effective September 10, according to a cablegram from Commercial Attaché Charles E. Lyon, Berne. The present duties on passenger automobile chassis ranging from 110 to 170 francs per 100 kilos, depending upon the weight of the chassis, remains unchanged.

Plans Diesel Tractor

PEORIA, ILL., Sept. 2.—The Caterpillar Tractor Co. is reported to be conducting extensive tests of a Diesel engine powered tractor perfected at its plants after five years' experimental work. After six months' further test on actual jobs under all conditions the factory expects to begin production of the new tractor, which will be classified as the "50."

Canadian Show Sees 33 Brands

New Frontenac Car by Dominion Motors Exhibited at Toronto

TORONTO, Aug. 31—The "Frontenac," a new six-cylinder car under the shield of Dominion Motors, Ltd. (formerly Durant of Canada), and 33 other brands of automobiles were on exhibition when Canada's National Motor Show opened here Aug. 28, in connection with the Canadian National Exhibition. The show will continue until Sept. 12.

Alvan Macauley, president of the National Automobile Chamber of Commerce and of the Packard Motor Car Co., and Vincent Bendix, retiring president of the Society of Automotive Engineers and president of the Bendix Aviation Corp., were to be honor guests of the show management on Sept. 2 at a luncheon to be held in honor of Automotive Day at the exhibition. They were also to be guests of the Canadian Section, Society of Automotive Engineers, at the annual Motor Show Banquet of the section, to be held on the evening of Sept. 2.

Dealers' meetings with factory representatives, a number of which are scheduled to take place during the show period, assume a particular importance this year because of the number of additional American manufacturers of passenger cars and trucks who have established Canadian plants to combat the effects of the Bennett budget and its tariff corollaries.

The annual convention of the Canadian Automobile Association is scheduled to be held Sept. 8 and 9 in Toronto, and it is expected that the delegates will attend the show. A large proportion of the 2,000,000 visitors who annually pass through the exhibition turnstiles visit the Motor Show building, which was erected last year at a cost of nearly a million dollars.

Passenger cars on exhibit at the Motor Show include, besides the Frontenac:

Auburn, Austin, Buick, Cadillac, Chevrolet, Chrysler, Cord, De Soto, Dodge, Duesenberg, Durant, Essex, Ford, Franklin, Graham, Hudson, Hupmobile, Isotta Fraschini, La-Salle, Lincoln, McLaughlin, Nash, Olds, Packard, Pierce-Arrow, Plymouth, Pontiac, Reo, Studebaker, Stutz, Willys and Willys-Knight, in addition to which there are about a dozen makes of trucks on approximately a fifth of a million feet of floor display space in the Automotive Palace.

Canada's National Aircraft Exhibition is held concurrently with the National Motor Show. The motorboat and motorcycle displays are housed under separate roofs, while tractors are located in the tented city, with demonstrating grounds immediately at hand.

Orders!

The Oilgear Co., Milwaukee, manufacturer of broaching machines and hydraulic feeds for machine tools, etc., is working on an order for 23 broaching machines costing about \$50,000, for delivery to the transmission plant of the Chevrolet Motor Co. at Toledo, Ohio.

We admit that the past few months have not been largely productive of the sort of news items which are scattered between this six-point suggestion that all the country's money is

Two orders for groups of 17 machines, gear chamfers and gear burnishers, have been received by the City Machine & Tool Works, Dayton. The machines, designed for special transmission gear operations, were ordered by two prominent automotive manufacturers.

not being spent on movies, sedatives, machine guns and financial services. But —all the items sprinkled herewith in beautiful ten-point Vogue boldface type were received during one

The Ingersoll Milling Machine Co. will furnish engine-production equipment for the 300-acre plant of Australian-Made Cars and Aeroplanes, Ltd., which will begin production of cars, trucks and airplanes in an immense tract near Sydney, Australia, about six months from now.

publication week. Printed in any size or face of type they would indicate that some important money is being spent by companies in the automotive field. Some of our contemporaries have begun the publication of regular columns of "Prosperity

The Hercules Motor Corp. has received another order from Russia, upon which production has already been started.

"Notes," which record from week to week, or month to month, such upwind straws. If we could think of a suitable heading, we might do it also, but we are inclined to believe that each item tells its own story, and that the moral thereof may safely be left to the reader.

Mullins Mfg. Co., Salem, Ohio, which specializes in the manufacture of automotive parts, has started production on a \$1,000,000 order for automobile body parts from two of the largest automobile companies in the country, R. F. White, vice-president, has announced.

The Mullins company is at present operating about 60 per cent of capacity production, Mr. White said. The present force is around 1000 men. To manufacture dies and tools for the new order will require 200 men.

British Models Issued Earlier

Six are Now on Market for Jump For 1932 Sales

LONDON, Aug. 20 (*by mail*)—British passenger car makers in general are issuing their announcements as to next year's models and prices earlier than in previous years. Standard was the first, introducing during the last week of July a new "Little Nine" at £155, a one-liter four-cylinder with a much roomier body for four adults than the midget cars of 750-850 cc. Prices of "continued" models with improvements, including a four-speed gearbox, were set lower by 10 to 15 per cent.

Triumph has astonished the industry by making price cuts of from 20 to 22 per cent in existing models, the 7 hp. and the 12 hp. Six; a new 10 hp. one-liter Four is in the program and a "pillarless" sedan body of which the two doors at each side have no pillar between them, the rear one latching on to the front. This body is designed for the 7 hp. chassis to afford easier access to the rear seats than the two-door body hitherto fitted to all makes of midget cars. The Six sedan is now £185 instead of £237.

Rover has today introduced a new 12 hp. (1410 cc.) Six at £225 with four speeds, silent third, a wheelbase of 8 ft. 8 in., a 4 ft. 2 in. track, and a roomy four-passenger body.

Lanchester, now a Daimler subsidiary, will announce in September a new light Six with the Daimler fluid flywheel and "self-changing" gears at a price that will be far below any previous Lanchester. L. H. Pomeroy is the designer and has utilized light alloys to a notable extent.

The Morris and Singer programs are due shortly and Austin at about the same time, though the latter is not believed to have any entirely new model. Hillman is another maker who will put forward a new light Four of 10 hp. (about 1200 cc.); it will supplement the existing Six and Eight.

Humber announces the same program as of late (three Sixes) with a price reduction of 5 per cent in one case. A change of note is the discarding of the Stromberg downdraft carburetor on the two-liter Six, a horizontal type of the same make being used instead, though the downdraft is continued on the larger Sixes.

Borg-Warner Declares

CHICAGO, Sept. 3—Directors of the Borg-Warner Corp. have declared the regular quarterly dividend of \$1.75 per share on the preferred stock, and the regular quarterly dividend of 25 cents on the common stock, both payable Oct. 1 to stockholders of record Sept. 15.

Men of the Industry and What They Are Doing

Get Russian Assignments

T. G. Stewart, formerly general superintendent of foundries of the J. I. Case Co., has left for Russia to assume the general superintendency of the Soviet's Kharkov tractor plant in the Ukraine. Herman H. Brien, formerly with the Belle City Malleable Iron Co. in Racine, and previously with the Dayton Malleable Co., Dayton, Ohio, leaves early in September to become superintendent of the malleable iron division of the Kharkov plant.

Bradford Leaves Ford

H. N. Bradford, manager of the Ford Motor Co. assembly plant in Des Moines, Ia., since December, 1929, resigned his position last week, it has been announced. Mr. Bradford has been associated with the Ford Motor Co. several years, coming to Des Moines from Chester, Pa., where he was assistant manager. For earlier years in his association he had been stationed with four different Ford branches.

Jones to Broadcast

"Casey" Jones, vice-president of Curtiss-Wright Corp., will conduct as a regular feature a weekly broadcast over the Columbia Broadcasting System. This feature will be presented Friday evening at 9:45, Eastern daylight saving time, and Mr. Jones will devote this period to commenting on the outstanding aerial achievements of the week.

Simmons Joins Brake Co.

C. R. Simmons, who was formerly assistant sales promotion manager of the Fruehauf Trailer Co., Detroit, has been appointed sales promotion manager of the Velvet Power Brake Co., also of Detroit.

Graham Names Norgar

E. G. Norgar, of the Walkerville, Ont., plant of Graham-Paige Motors of Canada, Limited, has been appointed manager of the service department as announced by Arthur Krueger, managing director of the company.

Pierce Transfers Jones

B. Frank Jones, for the last 12 years in charge of the truck engineering division of the Pierce-Arrow Motor Car Co., has been transferred to the sales department.

Delivers Navy Plane

CHICAGO, Sept. 2—The first of 32 planes for Navy Department by Great Lakes Aviation Corp., involving total

\$1,050,000, has been accepted by government officials. The corporation will rush the construction of remaining 31 planes for delivery to Navy as soon as completed.

Graham Prices Down

PHILADELPHIA, Sept. 2—Graham-Paige Motor Car dealers have announced nationally reductions of from \$100 to \$335 in the delivered prices of all current models of Graham passenger cars and Paige delivery cars with panel bodies. With a reduction of \$335, the Graham Special Eight, six-window, four-door sedan is now the lowest-priced eight of this type on the market, while the \$100 reduction on the Prosperity Six brings Graham cars to a new all time low price level. The following reductions in dealers' delivered prices include free wheeling and, except on the Prosperity Six, four-speed transmissions: Prosperity Six, \$100; Standard Six, \$185; Special Six, \$185; Special Eight, \$335; delivery car, \$200.

Materials' Index Declines

NEW YORK, Sept. 2—The Automotive Raw Materials' Index, compiled by Ray B. Prescott exclusively for *Automotive Industries*, dropped from 94, based on prices in effect in the middle of July, to 92, based on those in effect in the middle of August. In August, 1930, the Index stood at 102, according to Mr. Prescott. The Bradstreet general index of raw materials prices, it is interesting to note for comparison with the automotive, was placed at 98 for August of this year.

Apply for Show Space

CHICAGO, Sept. 2—Manufacturers to the number of 229 have applied for space at the Joint Trade Show of the Motor and Equipment Association and the National Standard Parts Association at Atlantic City, Dec. 7 to 12, 1931, according to a statement by W. G. Hancock, chairman of the M.E.A.-N.S.P.A. joint trade show committee, following a meeting of the committee at Chicago, Aug. 20.

Olds Ships 400

DETROIT, Sept. 2—August shipments of Olds Motor Works totaled about 400 cars compared with 1983 last year, with retail deliveries in excess both of production and deliveries for August, 1930. Total shipments to date aggregate 42,500 cars for the year or around 750 more than first eight months of 1930.

Opel Reports Second Loss

But Company Is Fortified With New Export Types

BERLIN, Aug. 19 (*by mail*)—In the second year of business, since the General Motors Corp., has taken interest in the Adam Opel Co. of Russelsheim a.M. in Germany, this company has suffered a loss to the extent of 13,885,000 marks (\$3,283,000). The first year had also finished with a loss, which, however, had not exceeded 2,288,000 marks (\$545,000). The legally prescribed reserve fund, which stood at 1,685,000 marks (\$400,000), has been used to cover part of the loss, the balance of which has been carried forward. The company has a share capital of 60,000,000 marks (\$14,300,000) and since the General Motors Corp. has acquired the majority 35,000,000 marks (\$8,340,000) have been newly invested in the plant and general equipment.

In spite of the heavy loss the management is sanguine as regards future development, the loss not being ascribed to the working of the company, but to the fact that the production had to be entirely reorganized. Formerly the company produced a large range of car and truck models and the change in the production program necessitated doing away with a great part of the old plant and materials as the works have had to be reequipped for the manufacture of only two small car models, which is now well under way and of two truck models. The reorganization work was practically completed during 1930, so that the current year is expected to effect a considerable improvement in the company's status the more so as the first small car model, a six-cylinder car of 110 cu. in. piston displacement, which was introduced at the end of last year, is proving a very successful line. Already now considerable quantities of these cars are being exported. During one of the recent months the export figure topped 1000 cars, and the management is confident that at no distant date at least two cars will be exported for every one sold within Germany. This month also the new four-cylinder car of 75 cu. in. piston displacement, numerous parts of which are identical with those of the six-cylinder model, has been introduced. As four-seater saloon it sells in Germany at 2700 marks (\$643), which is a highly competitive price, and it is expected to sell even better than the other car.

To Sell Jenkins Plant

COLUMBUS, OHIO, Sept. 3—The Industrial Plants Corp. (Ohio) on Sept. 15 will conduct a sale of the properties and inventory of the Jenkins Vulcan Spring Co.

German Manufacturers Turn to Export Markets in Depression

WASHINGTON, Sept. 2—A summary of the present condition of companies composing the German automobile industry has been prepared by Douglas Miller, assistant U. S. commercial attache at Berlin. Mr. Miller's report to the Automotive Division, Bureau of Foreign and Domestic Commerce, will appear in the Sept. 14 issue of *Commerce Reports*, the official organ of the bureau. Parts of it are reprinted below.

Opel. The Opel firm in Russelsheim, which has had favorable results with its new 6-cylinder car, reports that 12,000 units of this model have been sold since the Automobile Show in March. The Opel company is optimistic about its export prospects. Some time ago an announcement was made that production was contemplated in the future of as many as 150,000 units a year of which 100,000 were destined for export.

Recently the company has made renewed announcements that they are planning to build up their business in South America to a point where in the next year their export business will exceed their domestic business by 50 per cent and in two years by 100 per cent. Sales, of course, are contemplated of both the 4 and 6-cylinder types. It is interesting to note the report that Opel cars are being sold abroad at prices considerably below the figures quoted to the German customer.

N.A.G. The N.A.G. firm, a subsidiary of the A.E.G., reports poor business in the past year, and in closing its books for the year 1930 reports a net profit of only 27,000 marks. Considerable savings were realized by cutting down dealers' expenditure and distribution charges. In the previous year its capital was cut down from 17 million marks to 1.7 million marks, and then raised to 6 million marks again, which process was an expensive one for the parent company. Sales of the company's products, which are principally trucks, are reported as very slow. Last year an agreement was made between the company and the firm of Buessing.

Buessing-Brunswick. The firm of Buessing also manufactures trucks. This company reports the business situation in 1930 and the spring of this year as very slow, so that for 1930 losses of 680,000 marks are reported. The turnover fell from 34 million marks in 1929 to 17 million marks in 1930. Prices have been heavily reduced. Considerable losses had been sustained through bad credit risks among customers, and greatest caution in the sale of trucks in the future on credit has been urged.

Horch. Horch reports that in the first half of 1931 the company was able to increase its proportion of business in its class of car—8-cylinder passenger car—from 25 to 40 per cent of total sales in Germany. Business had been poor, but the Horch company

claimed to be getting more than its former share. A small number of employees have been discharged recently in expectation of a slowing down of business in the last half of the calendar year.

The company reports increased sales of cars in Greece, Bulgaria, Yugoslavia and other Balkan countries; since most Balkan buyers of automobiles are purchasing a car for the first time there is no difficulty about taking in old cars in part payment.

Hanomag. The Hanomag Company, whose automobile production is only a small section of its total activity, as it builds locomotives and other machinery, reports a reduction of a third in capital. Sales of automobiles were said to have been considerably improved over the preceding year, but prices had to be cut so drastically that the profit has been small.

N.S.U. The N.S.U. Company, Neckarsulm, reports a reduction in turnover of 28 per cent measured in units and 31 per cent measured in value from the preceding year. The company manufactures both cars and motorcycles, and shows a reduction in both types of vehicle. Present employees, numbering 2000, are working on short time and stocks of both cars and motorcycles are still high. Last year the company sustained a net loss of 948,000 marks, which was carried forward.

Daimler-Benz. The Daimler-Benz Company, principally operating at Stuttgart and Mannheim, reports that of all automobile companies in Germany for the first half of 1931 sales were 30 per cent below the preceding year in units and 45 per cent in value. The Daimler-Benz company shows a reduction, but not quite so great as the average. In April there was a slight improvement in the sale of trucks, which continued until very recently. The company reported a loss for last year of 7,457,000 marks, which reduced the reserve from 9,750,000 to 2,272,000 marks. The principal reason for the heavy loss incurred by the company is reported to be the maintenance of a very large and expensive plant with heavy amortization charges for the larger part of the machine tools purchased in more prosperous years at high prices.

Wanderer. The Wanderer Company in Chemnitz reports an increase of 80 per cent over the previous year in sales of passenger cars. This can be explained by the fact that the company was changing its model in the preceding year and was practically out of business, so that the percentage increase of sales this year is large but does not mean much in actual volume increase.

Adler. The Adler Company of Frankfurt-on-the-Main, manufacturing passenger cars, has introduced the 40-hour week and has discharged 130 employees for the second half of 1931. Sales are reported as considerably re-

duced. The company reports a drop in sales of cars of 15 per cent from the preceding year, which is partly made up by a reduction in the cost of raw materials and parts and a fall in wages. The number of employees has been kept about the same. The net profit for the year 1930 was 125,000 marks, but this includes the whole company which manufactures typewriters as well as automobiles. The plant was occupied in 1930 to about two-thirds of its capacity.

Henschel & Son. The firm of Henschel & Son, manufacturers of trucks, has discharged 400 office employees.

Krupp. The firm of Krupp in Essen has received an order for 200 trucks from the Soviet government. This company does not publish any annual figures as it is privately owned.

Magirus. The Magirus Company, manufacturing fire engines and trucks, reports a loss of 1,180,000 marks. The company has not paid any dividend since 1926. Sales are reported as somewhat reduced in trucks and omnibuses, but exports have been comparatively good. Sales of fire engines, however, have fallen heavily due to the reluctance of municipalities to make expenditures in these difficult times.

Selve. Selve is an automobile company manufacturing in Hameln. This company has completely gone out of business and is now only carrying on repair work and the sale of parts for cars previously sold. The loss in the year 1930 amounted to 6173 marks.

Hansa-Lloyd. This company, which has a plant in Bremen, reports a gross profit of slightly over one million marks, which was entirely consumed by taxes, interest and depreciation. This, however, is a comparatively good showing for German automobile companies at the present time. The concern reports an increase of 50 per cent in business in April and May over the previous year at that time. Stocks are being kept low. The increase is principally in the Goliath unit of the concern which manufactures 3-wheeled motorcycles used for the transportation of packages. These vehicles are tax free and do not require a driver's license.

Roehr. This company, which has a small plant just outside Darmstadt, has shut down and plans are being discussed for the sale of the concern. It is reported that a Swiss holding company is being organized, entitled "Holdinggesellschaft fuer Automobilwerke A.G. in Davo." It is reported that this company will take over the Roehr plant for 223,000 Swiss francs. This plant formerly manufactured about two passenger cars per day of an 8-cylinder type.

D.K.W. This car made by the Zschopauer Motorenwerke is a small popular 4-cylinder car. In Spandau 30 cars a day have been produced. Sales have been increasing this year until very recently.

Steel Mills Ready to Go

Expect Broader Releases From Automotive Market Shortly

NEW YORK, Sept. 3—Although the week preceding Labor Day is generally rated as an off-period in the steel market, an impressive number of finishing mills have been able to step up operations. One Mahoning Valley plant, following prolonged idleness, has resumed. Detroit automotive consumers are reported to have prepared their sources of steel supply for broader releases during the next fortnight. The many rumors that are being circulated in the sheet and strip market regarding impending changes of specifications for flat steel by one of the leading contenders in the low-priced car field as the result of preparations for bringing out a new model are accepted as indications of better demand being around the corner regardless of their correctness in point of details.

Steel sellers are not building any air-castles; a mild seasonal upturn is generally looked for in automotive consumption, that outlet being considered far more promising than others, such as the railroads, oil and gas and structural users of steel, the line pipe and building season approaching their end. While the market for full finished automobile body sheets is reported firm at 3.10 cents, Pittsburgh, and that for hot-rolled annealed sheets at 2.40 cents, competitive conditions under the prevailing circumstances may be expected from now on to become more and more of a factor. Market leaders are, perhaps more so than at any time in the last few years, determined to maintain the present quotations, but only the developments of the next four weeks can furnish the real test. Whatever the accuracy of newspaper reports from the Middle West that a prominent automotive consumer has developed in his research department an improved and economical method for making steel from low-grade ores and that exploitation of this process is contemplated, the story reflects clearly intensive pressure on steel prices by at least some of the larger consumers.

Pig Iron—According to returns to the Gray Iron Institute, July bookings showed an increase of approximately 12 per cent over June, bringing the percentage of unfilled orders on hand to approximately the level of July, 1930. The pig iron market continues easy, with buying by automotive foundries largely in abeyance.

Aluminum—Detroit consumption is reported to have been slightly better in August than in the preceding month. Further improvement is looked for from now on.

Magnesium—One of the two producers reduced his contract price to 32 cents a pound, a reduction of 16 cents per pound and the lowest price on record. In 1915, the price was \$5 per pound.

Tin—Straits tin sold at 27.15 cents at the week's opening.

September 5, 1931

Comet Engine Discontinued

MADISON, WIS., Aug. 31—The Comet Engine Corp., 215 South Dickinson Street, has discontinued the manufacture of aircraft powerplants and the shop, owned by the Gisholt Machine Co., turret lathes, has been offered to the city of Madison for a municipal service building. The Gisholt company has purchased part of the machinery of the Comet company and the remainder placed in storage. There is a possibility that the concern will resume production when conditions in the aircraft industry warrant.

Paul F. Schryer

MILWAUKEE, Aug. 31—Paul F. Schryer, general superintendent of tractor plants of the International Harvester Co., died at his summer home at Pewaukee Lake, Wis., on Aug. 22 at the age of 59 years. He has been ill with heart trouble for several years. Mr. Schryer was born at Sterling, Ill., and began work as a shop mechanic when 10 years old. Later he was a partner in the firm of Raleigh & Schryer, manufacturers of gas engines, at Freeport, Ill. When he came to Milwaukee in 1915 to join the I. H. C. works as general superintendent, the local plant had a payroll of 1200. He was instrumental in building the organization here to the point where more than 5000 were employed. The other tractor plants under his supervision are at Chicago and Rock Island, Ill. A son, Frank Schryer, is superintendent of the I. H. C. works at Hamilton, Ont.

Motor Securities Decline

NEW YORK, Sept. 1—Securities of seven representative automobile manufacturing concerns declined in value \$93,901,000 or 4.6 per cent during August, according to a compilation by Frazier, Jelke & Co., New York bankers. The month as a whole showed varying trends, some groups increasing in value and other groups dropping.

Among the groups which increased in value were oils, 10.3 per cent; amusements, 14.9 per cent; chemicals, 4.4 per cent; steels, 2.8 per cent; merchandising, 2.5 per cent; utilities, 2.1 per cent; electrical equipments, 1.8 per cent, and foods 1.1 per cent.

Groups which declined in value were railroads, 8 per cent; equipments, 6.1 per cent; motors, 6.4 per cent; miscellaneous industrials, 2.6 per cent, and mines .4 per cent. As a result of all these changes, the 100 stocks chosen from all groups by this company show a gain of 2 per cent.

Navy Buys Testing Units

WAUKESHA, WIS., Aug. 31—The Waukesha Motor Co. is filling an order from the United States Navy for five of the recently perfected fuel testing engines for aircraft and engineering laboratories.

Engine, Tractor Sales Reported

1929 Figure Neared Half Billion Dollars, Distribution Census Shows

WASHINGTON, Sept. 3—Sales in 1929 by 199 plants engaged primarily in making engines, turbines, tractors or water wheels totaled \$449,836,000, of which 71.8 per cent, or \$322,932,000, represented sales to distributors and manufacturers' own branches, according to the Census of Distribution. Sales to the two sources were almost equally divided, \$162,621,000, or 36.2 per cent, going to manufacturers' own branches and \$160,311,000, or 35.6 per cent, to distributors. The remaining 28.2 per cent, or \$126,904,000 worth of goods was sold to users, such as manufacturers of automobiles, boats, aircraft, etc.; power plants, factories, farmers, cotton ginnings, etc.

Of the sales to distributors and users only a small part, \$22,979,000, was made through manufacturers' agents, selling agents, brokers or commission houses. Thirty-nine plants employed such agencies, 11 of them selling their entire output in this way. The figures do not include sales made in this way by manufacturers' own sales branches.

Canadian Battery Production Declines

OTTAWA, ONT., Aug. 31—Production of storage and dry cell batteries in Canada during 1930 amounted in volume to \$6,712,080, as compared with \$7,757,389 in 1929 and \$8,189,573 in 1928. Twenty-seven different factories reported a production of electric batteries in 1930. These works gave employment to an average of 1189 persons, to whom \$1,577,787 was paid in salaries and wages, employed a capital of \$8,309,568, paid \$3,111,224 for materials used in manufacturing and reported total production valued at \$6,852,345, of which \$6,712,080 represented the value of batteries and parts.

Offers Radio Control Unit

CHICAGO, Aug. 31—Utah Radio Products Co. has announced the development of a new automobile radio remote control unit, the smallest of its kind on the market. With this arrangement it will be possible to locate the receiver under the floor boards to the rear of the car, or in other places away from engine and ignition disturbances.

Martin Goes to Europe

NEW YORK, Sept. 2—Glenn L. Martin, designer and manufacturer of airplanes, sailed for Europe today aboard the S. S. Paris, accompanied by Mrs. Martin.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Sept. 2—Business sentiment was favorably affected by the transfer of power in Great Britain to the coalition cabinet, with a promise of thorough-going financial reforms. A slight seasonal quickening was also noted last week in some lines of domestic trade, although business in general remains very quiet.

CAR LOADINGS

Loadings of revenue freight for the week ended Aug. 15 totaled 742,736 cars, showing an increase of 7956 cars over the total for the preceding week, but a decrease of 180,087 cars under that for the same week last year, and a decrease of 359,831 cars under that for the corresponding week of 1929. The weekly gain was hardly as great as would be expected on the basis of the usual experience at this time of year.

CONSTRUCTION AWARDS

Construction contracts awarded in 37 states during the first 22 days of August, according to the F. W. Dodge Corp., averaged \$8,526,000 daily, as against \$11,000,000 in July, and \$13,332,000 in August, 1930.

LUMBER ORDERS

Orders received by lumber mills during the week ended Aug. 22 were approximately 13 per cent above production, according to reports from 824 leading hardwood and softwood mills to the National Lumber Manufacturers Association. Shipments were also above production by about 12 per cent.

CRUDE OIL OUTPUT

Average daily crude oil production for the week ended Aug. 22 was 2,608,250 bbl., as compared with 2,498,500 bbl. for the preceding week, and 2,470,500 bbl. for the corresponding period last year. Martial law was maintained in the Oklahoma and Texas fields last week.

SOFT COAL OUTPUT

Production of bituminous coal during the week ended Aug. 15 averaged 1,162,000 tons daily, as against 1,134,000 tons a week earlier, and 1,362,000 tons a year ago. For the calendar year to date, output totals 234,015,000 tons, as compared with 281,562,000 tons in the similar period last year.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended Aug. 26 were 18 per cent smaller than those during the corresponding period a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices declined 0.5 points during the week ended Aug. 28 to a new post-war low at 68.9. This compares with 69.3 the preceding week, with 69.3, the previous low, established on July 31, and with 83.3 in the corresponding period a year ago.

STOCK MARKET

The stock market remained inactive last week, with prices fluctuating within a narrow range and trading on a comparatively small scale. Numerous groups of stocks, however, showed more firmness than had been apparent in preceding weeks. Call money remained unchanged at 1½ per cent.

RESERVE STATEMENT

Discounts of the Federal Reserve banks increased \$11,000,000, and open-market purchases \$26,000,000 during the week ended Aug. 26, while holdings of government securities remained unchanged for the second successive week. There were also increases of \$44,000,000 in note circulation, \$28,000,000 in deposits, and \$15,000,000 in reserves. The reserve ratio declined from 80.8 to 79.9 per cent.

Gasoline Consumption in June Gained 4.7 Per Cent Over Last Year's Mark

NEW YORK, Sept. 2—Gasoline consumption in 46 states and the District of Columbia for the month of June, 1931, as indicated by reports made by wholesalers and dealers in the various states under provisions of the gasoline tax laws or gasoline inspection laws, totaled 1,303,749,000 gal., compared with 1,244,780,000 gal. in June, 1930, an increase of 58,969,000 gal., or 4.7 per cent, according to the American Petroleum Institute. Daily average consumption for June, 1931, was 43,458,000 gal., compared with a daily average of 40,168,000 gal. in May, 1931, an increase in daily average during June of 8.2 per cent.

Gasoline consumption in these 46 states and the District of Columbia for the six months ending with June, 1931, amounted to 6,446,911,000 gal., compared with 6,248,924,000 gal. for the corresponding period of 1930, an increase of 197,987,000 gal., or 3.2 per cent.

The figures giving the quantity of gasoline sold or offered for sale, as reported under the various laws, follow. In some cases they are gross figures before deductions allowed for small quantities of gasoline reshipped or sold for other than taxable use, the tax upon which, if paid, is subsequently refunded. All figures are subject to revision.

GASOLINE CONSUMPTION BY STATES, JUNE, 1931

	Tax Per Gallon Cents	Month of			-6 Months Ending With	
		May, 1931 Gallons	June, 1931 Gallons	June, 1930 Gallons	June, 1931 Gallons	June, 1930 Gallons
Alabama	4	14,626,000	14,376,000	14,772,000	80,006,000	85,593,000
Arizona	5	6,494,000	6,898,000	6,566,000	37,597,000	38,520,000
Arkansas	6	9,984,000	9,183,000	11,434,000	59,491,000	66,413,000
Colorado	4	15,707,000	17,350,000	15,311,000	84,140,000	79,050,000
Connecticut	2	18,991,000	22,716,000	21,004,000	98,473,000	101,543,000
Delaware	3	4,653,000	3,361,000	3,293,000	17,257,000	16,521,000
District of Columbia	2	8,236,000	8,437,000	6,998,000	44,083,000	37,575,000
Florida	6	19,054,000	17,840,000	16,249,000	122,755,000	120,785,000
Georgia	6	19,037,000	19,144,000	18,357,000	106,091,000	108,098,000
Idaho	5	5,577,000	6,498,000	5,979,000	26,719,000	26,272,000
Illinois	3	88,827,000	93,223,000	89,732,000	467,297,000	445,840,000
Indiana	4	43,379,000	44,938,000	40,755,000	224,770,000	213,121,000
Iowa	3	33,162,000	38,336,000	34,957,000	198,232,000	181,940,000
Kansas	3	36,626,000	39,964,000	42,149,000	183,335,000	183,231,000
Kentucky	5	15,408,000	15,851,000	15,344,000	80,932,000	77,420,000
Louisiana	5	15,909,000	16,576,000	15,542,000	89,110,000	89,946,000
Maine	4	11,145,000	12,271,000	11,491,000	44,176,000	40,061,000
Maryland	4	16,507,000	17,482,000	16,553,000	87,214,000	83,472,000
Massachusetts	3	50,235,000	54,473,000	51,431,000	252,384,000	241,034,000
Michigan	3	73,250,000	75,316,000	74,985,000	368,850,000	368,230,000
Minnesota	3	40,767,000	41,615,000	38,253,000	200,709,000	177,407,000
Mississippi	5	11,701,000	11,500,000	11,384,000	164,003,000	67,110,000
Missouri	2	42,858,000	41,981,000	40,501,000	220,710,000	206,428,000
Montana	5	7,407,000	7,915,000	8,778,000	37,488,000	32,374,000
Nebraska	4	19,751,000	21,735,000	19,683,000	110,106,000	107,167,000
Nevada	4	2,127,000	2,564,000	1,977,000	10,785,000	8,248,000
New Hampshire	4	6,062,000	6,956,000	6,511,000	26,632,000	25,729,000
New Jersey	3	50,518,000	54,042,000	50,031,000	263,865,000	248,381,000
New Mexico	5	4,512,000	5,162,000	4,966,000	24,828,000	25,127,000
New York	2	147,269,000	152,703,000	142,510,000	728,171,000	686,525,000
North Carolina	6	18,237,000	18,689,000	20,464,000	110,265,000	119,177,000
North Dakota	3	12,243,000	10,529,000	11,302,000	45,275,000	53,060,000
Ohio	4	90,615,000	90,349,000	89,976,000	462,714,000	466,321,000
Oklahoma	5	25,650,000	32,491,000	31,206,000	149,733,000	154,688,000
Oregon	4	18,224,000	18,320,000	16,420,000	85,468,000	77,436,000
Rhode Island	2	9,071,000	9,405,000	7,877,000	44,146,000	39,804,000
South Carolina	6	10,196,000	10,498,000	9,642,000	58,069,000	56,484,000
South Dakota	4	12,756,000	13,534,000	12,766,000	63,292,000	64,942,000
Tennessee	5	18,045,000	20,071,000	19,327,000	99,929,000	99,574,000
Texas	4	72,106,000	77,273,000	72,982,000	394,154,000	384,042,000
Utah	4	5,215,000	6,204,000	5,857,000	28,775,000	28,674,000
Vermont	4	4,517,000	4,959,000	4,951,000	18,790,000	17,918,000
Virginia	5	20,952,000	22,282,000	20,006,000	103,264,000	104,074,000
Washington	5	26,290,000	27,209,000	24,996,000	134,419,000	125,025,000
West Virginia	4	12,647,000	13,533,000	13,278,000	61,352,000	61,065,000
Wisconsin	4	40,234,000	43,621,000	42,491,000	204,378,000	191,784,000
Wyoming	4	3,421,000	4,376,000	3,743,000	17,629,000	15,695,000
Total		1,245,198,000	1,303,749,000	1,244,780,000	6,446,911,000	6,248,924,000
Daily Average ..		40,168,000	43,458,000	41,493,000	35,618,000	34,524,000
Increase over previous year:						
Amount of Increase			58,969,000		197,987,000	
Percentage Increase in Daily Average			4.7%		3.2%	
Quarter Ended						
March 31, 1931		335,802,000	389,715,000	347,735,000	725,517,000	642,217,000
June 30, 1931						
June 30, 1930						

† Estimated.

‡ Revised.

Safety Group to Meet

CHICAGO, Sept. 2—During the week of Oct. 12 to 16, representatives of companies with delivery, taxicab and bus fleets will meet at the Stevens Hotel in Chicago to carry out a cooperative program to consider practical ways and means for the reduction

of accidents and accident costs for these fleets.

This program will be conducted by the Delivery, Taxicab and Bus Section of the National Safety Council as part of the Twentieth Annual Safety Congress and Exhibition. Supplementary programs will be conducted by the Street and Highway Traffic Section.

British Sales Off 8 Per Cent

Decrease in Registrations Shown for Each Month of '31

LONDON, Aug. 18 (*by mail*)—The latest returns issued by the Ministry of Transport of new cars registered apply to June; a decrease as compared with 1930 is shown again, as with every other month this year. The total for the six months is 8 per cent less than that of last year, taking all classes of motor vehicles; passenger cars are down 10.6 per cent, trucks 3.5 per cent and buses 3.4 per cent.

The actual numbers registered are:

	Total for Six Months 1931	Increase or Decrease for 1931
Cars	81,733	91,460
Trucks	23,593	24,553
Buses	8,202	8,495
Tractors	1,314	1,074
	114,842	125,582
		-10,740

Auburn Ships 1803

AUBURN, IND., Sept. 2—Shipments of Auburn and Cord cars for August totaled 1803, as compared with 609 for August, 1930, and 2507 in July of this year, R. H. Faulkner, president of the Auburn Automobile Co., announced today. This brings the total number of cars shipped by Auburn for the first eight months of the calendar year to 32,045. The company's total shipments for the 12 months of 1930 were 13,693. September orders now on hand indicate that shipments this month will be considerably increased over August, Mr. Faulkner said.

Petroleum Imports Up

NEW YORK, Sept. 2—Imports of petroleum at the principal ports in the United States for the week ended Aug. 29 have been estimated by the American Petroleum Institute at 161,429 barrels daily. This compares with the daily average of 147,714 barrels for the week ended Aug. 22, and with 183,429 barrels for the four weeks ended Aug. 29.

Crude runs to stills during the week are placed at 2,453,000 barrels daily. Cracked gasoline produced during the week was placed at 3,428,000 barrels.

Canadian Financing Off

OTTAWA, ONT., Sept. 1—The figures for automobile financing compiled by the Dominion Bureau of Statistics show a decrease in July as compared with June of this year, and indicate a falling off in financing, as compared with the corresponding month (July) in 1931. The per cent of change is 37.7.

The total number of cars financed was 10,247 in July, 11,537 in June,

1931, and 13,420 in July, 1930; and the amount of financing was \$4,165,076 in July, 1931, \$4,918,444 in June and \$6,681,518 in July, 1930.

New cars financed were 3381 in July, 3796 in June and 5077 in July, 1930; while used cars financed were 6866 in July, 7741 in June, and 8343 in July, 1930.

Financing of new cars amounted to \$2,095,153 in July, \$2,444,721 in June, and \$2,903,003 in July, 1930. Financing of used cars amounted to \$2,069,923 in July, \$2,473,723 in June, and \$3,778,515 in June, 1930.

N. A. C. C. Show Applications Mailed

NEW YORK, Sept. 2—Applications for space at the National Automobile Shows to be held in New York and Chicago, January, 1932, are being mailed out this week. Applications are being mailed car manufacturers by the National Automobile Chamber of Commerce and applications to parts, accessories and service equipment manufacturers are being mailed out by the Motor and Equipment Association.

It is anticipated that the support of the Service Equipment Section of the show will be increased this year due to the greater liberality on the part of the show management in the question of arrangement and decoration of booths. While there will be restrictions on the type of display and decoration in this section, exhibitors will not be confined to the same restrictions as applied to the car exhibits in the show this year as they have in the past.

Commercial Credit Declares

BALTIMORE, Sept. 2—at the regular meeting of the board of directors of Commercial Credit Company, held Aug. 27, regular quarterly dividends on the 6½ per cent and 7 per cent first preferred stocks, 8 per cent Class B preferred and the \$3 Class A convertible stocks were declared. The board also reduced the regular quarterly dividend from 50 cents to 40 cents per share on the common stock. These dividends are payable Sept. 30 to stockholders of record Sept. 10, 1931.

M. E. A. Directors to Meet

NEW YORK, Sept. 2—Motor and Equipment Association will hold a Directors' Meeting at the Book-Cadillac Hotel, Detroit, Sept. 15 to 16, at which time plans for the reorganization of the association will be discussed further. Ballots to members to vote on the reorganization plan have been mailed out. On Sept. 17, also at the Book-Cadillac Hotel, the association will hold drawings for the Atlantic City Show to be held Dec. 7 to 12.

M. E. A. Index Gained in July

Sales of Original Equipment Showed Decrease, However

NEW YORK, Aug. 31—Shipments of service parts to wholesalers during July showed a two point increase over June, according to reports received from member automotive manufacturers by the Motor and Equipment Association. The July index figure stood at 124 per cent of the base (January, 1925) to compare with 122 for the preceding month.

There were declines, however, in shipments of original equipment to vehicle manufacturers, accessories to wholesalers, and service equipment to wholesalers so that the grand index of all shipments showed a decline from June.

This grand index for all groups of manufacturers reporting to the M.E.A. for July stood at 85 per cent of the January, 1925, base figure of 100, as compared with 98 for June and 88 for July, 1930. Several plants reported that they were closed during July for the usual summer vacation or inventory period.

Reports by divisions of member manufacturers in July follow: Parts-accessory makers selling their products to car and truck makers for original equipment made shipments aggregating 79 per cent of the January 1925 base to compare with 91 for June, 129 for May and 83 for July, 1930.

Shipments to the trade by makers of service parts were 124 per cent of the base, as compared with 122 for June, 128 for May and 127 for July, 1930.

Accessory shipments to the trade in July stood at 57 per cent of the base to compare with 61 for both June and May and with 65 per cent for July, 1930.

Service equipment shipments, that is, garage equipment and tools, were 85 per cent of the base, as compared with 102 for June and 117 for May.

Marmon Offers Custom Line

INDIANAPOLIS, Sept. 2—A new line of custom bodies on the Marmon 16 chassis is announced by George C. Tenney, Marmon general sales director.

This line is composed of 32 body styles which, with the addition of the eight standard types, makes a total of 40 different Marmon 16 body styles now available.

Battery Makers to Meet

NEW YORK, Sept. 2—National Battery Manufacturers' Association will hold its seventh annual convention at the Hollenden Hotel, Cleveland, Ohio, Oct. 22 to 23 inclusive. The program committee is now at work developing the business program.

Case Omits Dividend

CHICAGO, Sept. 3—A decision to omit the quarterly dividend of \$1.50 a share on common stock of the J. I. Case Co., manufacturers of farm implements, was made yesterday at the regular quarterly meeting of stockholders because of unfavorable farming and business conditions. A statement issued after the meeting declared crop failures caused by drought have seriously affected the farming business in the United States and South America and have resulted in substantial reductions in the volume of sales and slowed up collections. This situation has raised unemployment problems in the company factories requiring special consideration this winter, it was pointed out. The regular quarterly preferred stock dividend of 1½ per cent, however, was declared, payable on Oct. 1, to holders of record Sept. 12.

Nash Ships Trainload

CHICAGO, Sept. 3—A trainload of Nash cars is being shipped to Seattle this week by the Kenosha factory. This shipment is to fill the pressing demand for cars on the West Coast, the announcement says. There is continued business improvement and continued public demand noted in August sales. New York, Chicago, Pittsburgh, Cincinnati, San Francisco and Los Angeles dealer organizations delivered an average of 28.2 per cent more new cars the week ending Aug. 15 than they did same period a year ago.

Plans Finance Company Meeting

CHICAGO, Sept. 3—The call for a conference of financing concerns to discuss among other matters, ways and means for employing their facilities to restore normal retail buying and end the depression was issued today by C. C. Hanch, general manager of the National Association of Finance Companies.

Oakland Produces 4565

DETROIT, Sept. 3—Production of Pontiac cars by the Oakland Motor Car Co. during August more than doubled the production for August, 1930, with a total of 4565 as against the 2185 last year. Total Oakland-Pontiac production for August was 4927 as against 2801 in August last year. According to W. A. Blees, vice-president in charge of sales, the last 10 days of August showed a marked gain in registrations over the two previous two ten-day periods. Oakland-Pontiac's expanded merchandising program went into effect on Aug. 21. For the current year Pontiac production is 31,062 cars ahead of the first eight months of 1930.

Chassis Lecturer Killed

DETROIT, Aug. 31—E. J. McMullan, prominent chassis lecturer employed by Olds since 1916, together with R. E.

Tyler, representative of the Cleveland Olds Branch, were killed in an automobile accident August 24 while driving from Akron to Cleveland. Mr. McMullan formerly worked for Cadillac, and was president of the Chassis Lecturers Club.

Price Maintenance Upheld

LONDON, Aug. 18 (*by mail*)—The report of a committee appointed by the government to consider certain trade practices—known as the Restraint of Trade Committee—is a complete vindication of the principles of price maintenance as enforced, as far as possible, for many years past by the motor industry of Great Britain.

Illinois Sales Drop

CHICAGO, Sept. 2—New car sales in Illinois for August were 10,404, compared with 13,874 for July and 12,113 in August last year. Cook County sold 5298 cars, or 619 less than a year ago. New car sales for the first eight months averaged 98,583 as compared with 137,960 for the same period last year.

Lists More Stock

NEW YORK, Aug. 31—Stewart-Warner Corp. has secured additional listings on the New York Stock Exchange of 15,000 shares of its \$10 par common stock. This block is for sale to employees of the corporation and subsidiaries in accordance with the employee purchase plan development by the company.

Purchases Lambert Patents

NEW YORK, Aug. 31—General Tire and Rubber Co. has purchased all patents, molds and sales rights of the Lambert "Trublpruf" cushion truck tire. The General company is now in production on these tires and will distribute them through regular General tire distributors.

Mack Trucks Declares

NEW YORK, Sept. 2—Mack Trucks, Inc., has declared a dividend of 50 cents a share payable Sept. 30 to stockholders of record Sept. 15.

Swiss Market Better

WASHINGTON, Sept. 2—Switzerland's automotive imports, the largest part of which are obtained from the United States, took a surprising upturn during June and brought the total for the first half month of the current year ahead of the corresponding period of 1930, according to a report received in the Department of Commerce.

The improvement was first noticeable in April and became more marked in May. During June 1165 cars and trucks were imported as against 902 in June a year ago. During the first six months of the year 6116 cars and trucks were imported, as compared with 6016 in the first half of 1930.

Imports from the United States the leading supplier, during the first half of the year totaled 3291 cars and trucks, as compared with 3470 in the 1930 half year, indicating a maintenance of the trade within 5 per cent.

France, the second largest supplier, provided 1069 as against 1114, a decrease approximately the same as that of the United States.

Germany was the only prominent supplying nation actually to increase her exports to Switzerland, the totals being 801 as against 364. Italy, providing 815, as compared with 978, was approximately 17 per cent behind.

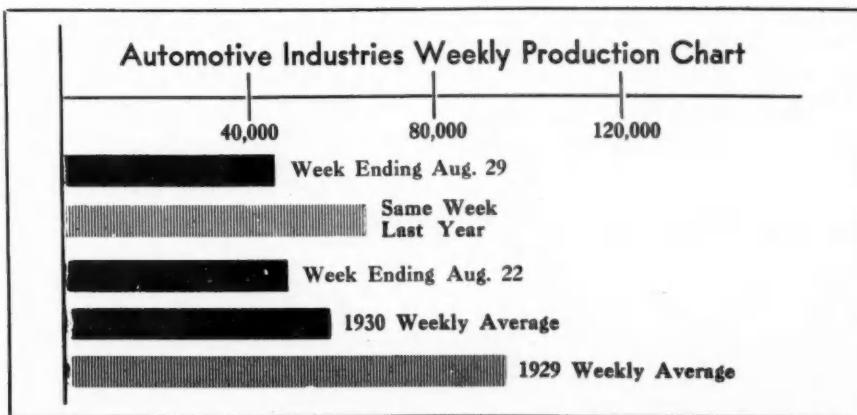
Gearing Heads 3 Plants

Charles M. Gearing, division manager of the Meriden plant and member of the board of directors of the New Departure Mfg. Co., has been selected to fill the position of general works manager with offices in Bristol, Conn., according to announcement made by the management.

Mr. Gearing's duties will include general supervision of production in all three plants. He will assume his duties Sept. 1, but for the present will maintain his residence in Meriden.

Hupp Signs 33 Dealers

DETROIT, Sept. 3—Twenty new dealers and three distributors were signed during August by Hupp Motor Car Corp.



July Output Off 31,696

Bureau of Census Sets Month's Figure at 218,961 Units

WASHINGTON, Sept. 3—Declining 31,696 units, the output of motor vehicles in the United States in July was 218,961 as against 250,657 in June, according to reports received by the Bureau of the Census from 144 manufacturers. The output of passenger cars dropped 26,028 to 182,927, while the truck production decreased 5488 to 35,854 and taxicab output dropped 50 per cent to 180 from 360.

In the first seven months of the current year, the production of motor vehicles in the United States totaled 1,791,913, a drop of 672,200 under the corresponding period of last year. The output of passenger cars declined 604,392 to 1,497,798 while the truck output reflected a drop of 86,800 to 291,119. The taxicab production declined to 2996 from 5004.

The production of motor vehicles in Canada in July was only 4220 as against 6835 in June. The passenger car output was 3151, as compared with 5583, while the truck production was 1069 as against 1252. The total production of motor vehicles in the first seven months of 1931 was 70,312 as against 120,873 in the corresponding period of last year. The passenger car output was 55,962 as against 101,915 and the truck output declined to 14,350 from 18,958.

Wheeler-Schebler Moves

DETROIT, Aug. 31—Manufacturing operations of the Wheeler-Schebler Carburetor Co., Indianapolis, subsidiary of the Marvel Carburetor Co., are being moved to Flint. The company which is one of the oldest in the industry will retain the name "Wheeler-Schebler." It is expected that the move will be complete about October 1.

White Reports Loss

NEW YORK, Aug. 31—White Motor Co. and subsidiaries report net loss for the six months ended June 30 of \$1,004,910. This compares with profit for the corresponding period of last years of \$1,048,710, or \$1.31 a share on capital stock. The company has omitted the quarterly dividend of 25 cents due at this time.

Brockway Reports Loss

NEW YORK, Aug. 31—Brockway Motor Truck Corp. shows net loss for the six months ended June 30 of \$550,475. This compares with net profit for the first half of 1930 of \$212,335, or 60 cents a share on common stock after payment of preferred dividends.

++ CALENDAR ++ OF COMING EVENTS

SHOWS

Olympia Passenger Car Show, London Oct. 15-24
Olympia Truck Show, London, Nov. 5-14
Passenger Car Show, Glasgow, Nov. 13-21
Motorcycle Show, London, Nov. 30-Dec. 5

CONVENTIONS

Eastern States Exposition, Springfield, Mass. Sept. 20-26
American Welding Society, Boston, Mass. Sept. 21-25
American Electric Railway Assn., Atlantic City, N. J. Sept. 26-Oct. 2
S.A.E. National Production Meeting, Detroit Oct. 7-8
National Safety Council, Chicago, Ill. Oct. 12-16
Society Industrial Engineers, Pittsburgh, Pa. Oct. 14-18
Transportation Meeting, S.A.E., Washington, D. C. Oct. 27-29
American Chemical Society, Buffalo, Aug. 31-Sept. 4
American Society Mechanical Engineers (General Meeting), Kansas City Sept. 7-9
W. Va. Motor Transportation Assn., Charleston Sept. 11
Society for Elec. Development, New York City Sept. 11
Steel Founders Society, Chicago, Sept. 17
American Institute Mining and Metallurgical Engineers—Iron and Steel Division, Boston Sept. 21-24
American Society for Steel Treating (National Metal Exposition), Boston Sept. 21-25
American Society Mechanical Engineers—Machine Shop Practice, Boston Sept. 21-26
American Gear Mfg. Assn., Pittsburgh Oct. 15-17
National Hardware Assn., Chicago, Oct. 19-22
American Iron and Steel Institute, New York City Oct. 23
American Railway Assn.—Motor Transport Division, Chicago, Oct. 27-28
American Society Mechanical Engineers—Annual meeting, New York City Nov. 30-Dec. 4
American Roadbuilders Association, Detroit, Mich. Jan. 11-14, 1932

Milwaukee Plant Schedules

MILWAUKEE, Aug. 31—Production at the Milwaukee assembly plant of the Ford Motor Co. in September is scheduled at approximately the July and August rate, it is announced by L. T. Henderson, branch manager. The September schedule calls for 90 cars daily with plant operating about 10 days. The payroll of 700 will be fully maintained.

Develops Enclosed Motor

NEW YORK, Aug. 31—General Electric Co. has developed a new, explosive-proof, totally-enclosed, fan-cooled, single-phase motor which can be used in airport and marine gasoline filling stations, garages and other places where there are explosive fumes that might be ignited by a spark from the electric motor.

Parts Business Passes Billion

Census of Distribution Summarizes It For Year 1929

WASHINGTON, Sept. 3—Reports to the census of distribution show that sales amounting to \$1,314,936,000 were made in 1929 by 1145 plants engaged primarily in making motor vehicle bodies and parts, of which \$1,102,560,000 or 83.8 per cent, represented sales to users, including manufacturers of complete automobiles, operators of fleets of trucks, private owners, etc. This classification, the Bureau reports, may include some interplant transfers, for a few of the manufacturing plants reported such transfers as sales to industrial users.

Manufacturing plants sold 1.8 per cent or \$23,105,000 worth to their own wholesale branches for resale to dealers and industrial users. The remaining sales were made as follows: To wholesalers, 10.8 per cent, or \$142,232,000; to retailers, 3.6 per cent, or \$47,039,000. Of the sales to dealers and industrial users, \$33,066,000 was made through manufacturers' agents, selling agents, brokers or commission houses. One hundred nineteen manufacturing plants sold through such agents, 28 of them selling their entire output in this way.

Sets Show Rules

NEW YORK, Aug. 31—Rules for the second joint Motor and Equipment Association-National Standard Parts Association Trade Show, to be held in Atlantic City, N. J., Dec. 7 to 12, have been announced by the Joint Show Operating Committee. These rules cover the eligibility of guests:

1. The list of invited guests shall not include any non-member concern that has resigned or been expelled from either association.
2. Companies eligible for membership in either association that have had a representative in attendance at any one previous show, are not eligible for show attendance unless their application is pending at show time.
3. Special lists of individuals and firms not eligible for association membership but desirable as show guests will be approved by the Credentials Committee. Overseas wholesalers will be invited to attend the show during the entire six days. Car factory service managers, representatives of branches of the United States government and executives of national automotive trade associations will be invited to attend the show on designated days.

The invitations will be mailed about October 15.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Schneible Wet Type Dust Collector

A wet type dust collector for industrial purposes has been placed on the market by Claude Schneible, Chicago, Ill. Its design has been simplified to eliminate moving parts, spray nozzles, and pockets.

Dust-laden air, vapors, gases or other products to be cleaned or recovered are introduced at the bottom of the tower tangentially to the periphery. Water or other liquid media introduced at the top of the tower fall in a spray through succeeding plates of the tower, giving an intimate contact with the upward moving air or vapor which has continued to spiral in its course due to the vanes in each plate. There are two washes per plate and standard equipment provides six plates or twelve washes.

This equipment is capable of handling air saturated with moisture and hot gases or fumes. The cleaning action is illustrated by the cut-away view—clean air escapes from the top of the tower and can be returned into the plant or exhausted into the atmosphere.

Shafer Roller Bearing Units

A new line of self-aligning roller bearing units for normal duty applications has been added to the line of the Shafer Bearing Corp., Chicago, Ill. Shafer double row self-aligning roller bearings, as used in the standard duty units, are now available in these lighter weight housings. The normal duty units are furnished as pillow blocks, flange units and take-up units, in a full range of shaft sizes from $\frac{3}{4}$ in. to 3 in.

The inner race of the bearing is extended on one end only and fastened to the shaft by a special locking collar, providing ample capacity for the intended service and a simplified application of the unit on the shaft. Sealing is accomplished by a grease seal consisting of two steel stampings

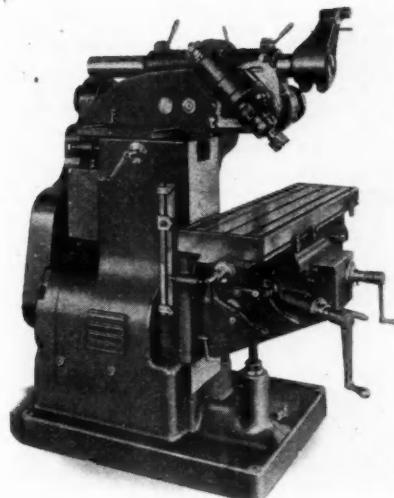


pressed into the housing or cover. Between these stampings is a $\frac{3}{32}$ fiber washer which will be a slip fit on the extended cone. This effectively excludes dirt and other abrasive materials, retains lubricant and prevents leakage.

Van Norman Duplex Miller

Power vertical feed and a pivotally adjustable cutter head distinguish the No. 21 duplex milling machine recently brought out by the Van Norman Machine Tool Co., Springfield, Mass. Feed is obtained by means of telescoping screws driven by bevel gears from the same mechanism which provides the longitudinal feed of the table and the cross feed of the saddle. The power vertical feed is controlled by one adjustable and two fixed stops on the column which operates a plunger to effect disengagement at the desired heights.

Sixteen feed changes for the vertical, cross and longitudinal movements of the machine are obtained through a gear box on the right hand side of the column. From this gear box, power is carried through a tele-



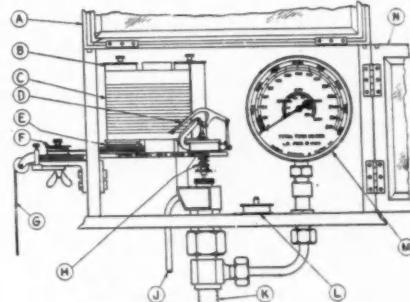
scoping shaft and universal joints to a gear train in a compartment on the right hand side of the knee. These gears transmit the drive to the knee elevating screw, cross feed screw and the table feed screw. The train also comprises gears for reversing all feeds. Twelve spindle speeds, 28 to 466 r.p.m., are available through gears

in the ram. Coolant may be supplied to the cutter and work from a reservoir cast in the base, by a reversing pump driven from the feed gear box through a V-belt.

Motor required is 3 hp., 1150 r.p.m. Floor space is 88 in. in direction of table travel and 70 in. depth. Approximate net weight, 3900 lb. without motor.

Axle and Hydraulic Press Recorder

An instrument for measuring and recording the force and pressure exerted on a hydraulic ram at all points of its stroke has been placed on the market by the Dobbie-McInnes & Clyde, Ltd., 57 Bothwell St., Glasgow. While it is principally employed in connection with axle presses, it is suitable for all types of hydraulic presses and testing machines, and consists of three main units: gage, recorder and reducing gear. The gage,



which is of the hydraulic type fitted with a maximum indicator, is graduated in tons force on the ram and also in lb./sq. in. pressure. It is connected through high-pressure piping to the ram cylinder and also to the recorder, with which it acts in conjunction.

The recorder operates on the engine indicator principle, i.e., a diagram is drawn on a paper strip by means of a pen arm coupled through a magnifying link gear and pressure spring to a piston in contact with the fluid under pressure. The piston is of stainless steel to avoid corrosion. The paper is in roll-form and is wound from a magazine drum to a receiving drum in lengths corresponding to the stroke of the ram. This is accomplished through a ratchet driven from the reducing gear to which a lead from the ram is attached. The paper is marked with horizontal lines, the distance between each representing 10 tons force on the ram.

The reducing gear consists of two (differential) pulleys. The larger one receives the lead from the ram and the smaller carries a cord to the ratchet gear of the recorder drum. The smaller pulley may be replaced by either of two spares of different diameter so that the travel of the paper may be varied to suit conditions.

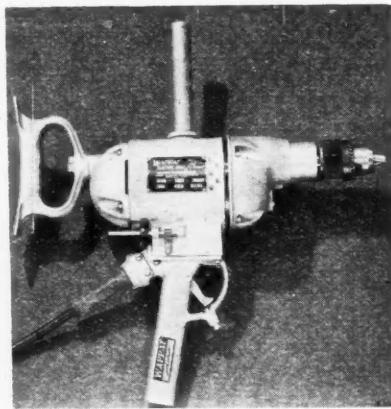
(Turn to page 376, please)

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Wappet $\frac{1}{2}$ in. Utility Drill

For general maintenance work, Wappet, Inc., division of Simonds Saw and Steel Co., Pittsburgh, Pa., offers the Wappet Red Streak standard duty drill type 121 with a capacity of $\frac{1}{2}$ -in. in steel. Comfortable operation is insured by streamline design and

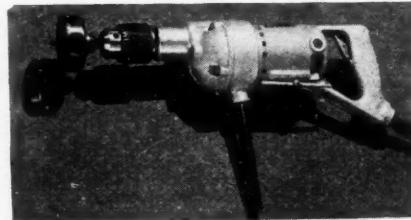


perfect balance. The spade handle swivels to any position and the pipe handle is removable for drilling in close corners.

Full load speed is 248 r.p.m. Net weight 14 $\frac{1}{4}$ lb.

Wappet Slow Speed Hole Saw

Automotive men will be interested in the type 145 Wappet drill recently placed on the market by Wappet, Inc., division of Simonds Saw and Steel Co., Pittsburgh, Pa. It is designed for use with hole saws and drilling hard metals. Its capacity is up to $\frac{1}{2}$ -in. diameter in steel and 3-in. diameter hole saw.

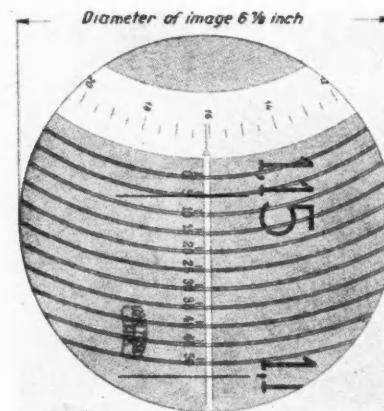


Full load speed is 200 r.p.m. Net weight, 10 lb. According to the makers this drill cannot be stalled by any hand drilling test.

Zeiss Optical Cam Checking Device

Carl Zeiss, who is represented in this country by the George Scherr Co., 128 Lafayette Street, New York City, has just placed on the market an optical cam checking device. It consists of an accurately scraped surface plate, with two parallel T slots, an optical dividing head and tailstock and a measuring microscope. The optical dividing head and tailstock are mounted and aligned by the main T slot, while the measuring microscope is mounted and lined up by the second T slot. The two T slots being parallel, will insure the proper alignment between dividing head and tailstock, as well as measuring microscope respectively.

The camshaft is taken between the centers of the dividing head and tailstock as shown in the illustration, and the angular setting of the camshaft, as represented by the specification on the B/B, is readily secured from the optical dividing head, the reading being directly in one minute, with the possibility of estimating 20 seconds by



eye. The accuracy of the dividing head, being obtained from a glass dial, is such that the error for the angular setting will not exceed 5 seconds of the arc.

The rise and fall of the cam for each angular setting are secured by means of the measuring microscope, the measuring element of which is an accurate scale, embedded in a plunger that moves freely in or out in triple roller bearings. This plunger is so adjusted that it travels in a plane with the axis of the centers and parallel to the surface plate. The plunger contacts

with the cam by means of special anvils of the same shape as the valve stem head called for in the blueprint. The contact is made under a uniform pressure which can be varied by weight.

The outstanding feature of the measuring microscope for checking the rise or fall of the cam is that the reading is obtained directly from a scale, without the use of other standards or masters. The measurements being read from scales and dials only are therefore not subject to change or errors. The scale on the plunger is graduated into 0.05 in., which is divided by a spiral micrometer ocular into 0.00005 in., and the reading is obtained all in the same ocular. As shown in the cut, the reading would represent 1.1566 in.

After one cam has been checked, the measuring microscope in its post is moved over to the next cam along the T slot, and is then clamped into position again.

Aetna Heavy Duty Bearings

A complete line of roller bearings has been brought out recently by the Aetna Ball Bearing Mfg. Co., Chicago, for service where heavy loads and sudden shocks are to be carried, their capacity being from 50 to 100 per cent greater than that of ball radial bearings of the equivalent size.



This consists of the CR-200, CR-300 and CR-400 series for light, medium and heavy duty, comprising 64 bearings ranging from 1 3/16 to 10 7/16 in. outside diameter.

These bearings are standardized and interchangeable with other makes and types of bearings as to inside and outside diameters, and are interchangeable with S.A.E. standard ball bearings.

The inner race has a double lip to hold the rollers in line endwise, but there are no lips or shoulders on the outer race. Therefore the rollers are free to move across this race, thus preventing cramping in case of contraction or expansion of the shaft, etc. Both ends of the rollers are ground to minimize friction. These bearings are fitted with cages or either brass or steel, as desired.

(Turn to page 378, please)

A thousand million miles of Silent Proof!



A thousand million miles have whirled past GUNITE cast brake drums in service on all kinds of automotive vehicles—trucks, trailers, buses, and passenger cars. And, in this billion miles of silent service—*out-wearing, out-lasting, out-performing other brake drums*—Gunite cast drums have built such a favorable user-acceptance that manufacturers are finding "equipped with Gunite Cast Brake Drums" to be a most important sales advantage.

This remarkable record has prompted many manufacturers and fleet operators to write us unusually enthusiastic letters about the safety and savings effected by Gunite Cast Brake Drums.

If you don't already know the story of this special cast brake drum metal—or know of the complete high speed production equipment which enables us to produce these money-saving, record-making drums at low cost—we suggest that you write us. Full information awaits your forwarding address. The only obligation will be ours in furnishing you with all the facts about Gunite Cast Brake Drums as applied to your product. The Gunite Corporation, Rockford, Illinois, U. S. A.

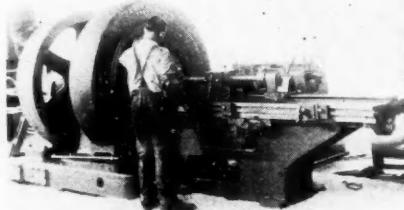
 **GUNITE**
Cast BRAKE DRUMS

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Langelier No. 8 Swager

A newly improved No. 8 swaging machine, which is said to be the largest of its kind, has been completed by the Langelier Mfg. Co., Providence, R. I. It is capable of tapering and reducing work up to a finished diameter of 9 in., occupies a floor space approximately 6 ft. wide x 16 ft. long, and weighs approximately 40,000 lb. The spindle is driven through a 5-ft. diameter sheave which also acts as a flywheel and is powered by a 50-hp. motor mounted on a sliding base on a separate foundation. Seven 1 1/4 in. x 7/8 in. V belts are used. The spindle revolves at 150 r.p.m. in bronze bushings in the head and back bearing, the flywheel being mounted



on a tapered portion of the spindle between the two bearings.

The machine is constructed with the Langelier type of fixed head rolls, using 14 of these rolls set in a high carbon steel head ring. This arrangement produces 2100 positive die blows to the work per minute. Die opening is controlled by stop rods engaging the full length of the hammerblocks. The spindle slot is lined, sides and rear, with special hardened steel plates. Hammerblocks, dies, hammerblock rolls and head rolls are all made of special alloy steels hardened and ground to close limits. Dies are made and the machine is arranged for handling the work either hot or cold as conditions require.

The saddle is actuated through a hydraulic cylinder having a stroke of 42 in. This is the longest swaged length of work possible in one operation. The greatest overall length of tube which can be handled is 96 in. Dogs on the front of the saddle are capable of being positioned to automatically produce the proper cycle of rapid traverse, feed and reverse. A hand control lever is conveniently located to give the operator positive and

instantaneous control throughout the cycle. An oilgear pump direct-connected to a 5 hp. motor mounted on a separate base and foundation directly behind the holder delivers hydraulic pressure of 1000 lb. per sq. in. to the cylinder at a maximum volume of 3060 cu. in. per min. Rapid traverse speed is at full pump delivery, which produces approximately 240 in. per min., and the feed rate is adjustable from 0 in. to 240 in. per min.

Hammond General Purpose Grinder

According to a recent announcement, the Hammond Machinery Builders, Inc., Kalamazoo, Mich., has added a new grinder for tool, casting and general purpose work. One feature of this machine is that the whole spindle assembly can be removed from the pedestal without disturbing any mechanical part. This is a particular advantage when it is necessary to renew belts. Universal adjustable wheel guards are standard equipment. They are adjustable to the wear of the wheel and the clearance between grinding wheel and top of wheel guard can be maintained at a safe dimension as the wheel becomes worn. A shatterless glass, adjustable eye shield is standard equipment.

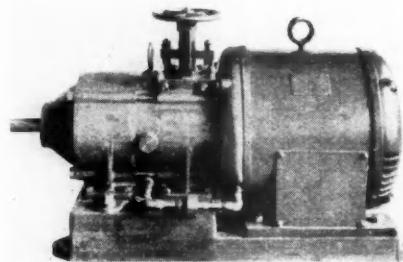


Power is transmitted from the motor to the spindle by means of multi-V belts. The motor is mounted in the rear of the pedestal. These machines can be used in tandem and operated at different speeds, inasmuch as the speed of the spindle is not limited to the speeds of alternating current motor. It can be supplied with 10, 12, 14 or 16 in. diameter wheels in 1, 2, 3 and 5 hp. capacities.

New Electro-Hydraulic Transmission

The American Engineering Co., Philadelphia, Pa., announces the introduction of a small, compact 5-hp. electro-hydraulic transmission. The transmission will develop full rated torque at any speed, whether it be 1 r.p.m. or 1000 r.p.m. Since the torque is constant the horsepower output varies with the speed of the hydraulic motor. At maximum speed the transmission will develop 5 hp. continuously.

The hydraulic pump and motor are of the Hele-Shaw design and are similar in construction except that the motor has a fixed stroke, while the stroke of the pump may be varied from minimum to maximum. Pump and motor are multi-cylindred and handle the fluid in a smooth continuous stream.



The electric motor drives the pump shaft at a constant speed. Oil is delivered by the pump to the hydraulic motor at a rate corresponding to the stroke of the pump, regulated by the hand wheel shown, or any other desirable hand or automatic control. This is the only point of regulation, for there are no controls on the electric or hydraulic motors. Through the handwheel the speed of the hydraulic motor can be varied all the way from zero to maximum in either a forward or reverse direction.

In the picture the hydraulic motor is at the left, hydraulic pump next to it in the middle, and electric motor at the right. They are all mounted on a single bed plate reservoir which contains the oil used in the system. The entire transmission, including motor, is only 30 in. long, 14 in. wide and 16 in. high.

EC&M No. 2 Type ZO Motor Starter

Another type ZO across-the-line motor starter has been added by the Electric Controller & Mfg. Co., Cleveland, Ohio. This No. 2 unit is a companion to the well-known No. 1 starter. Like the latter, it is a self-contained unit, totally inclosed with oil-immersed main and control circuit contacts and vapor-proof overload relays. The entire unit is of compact

(Turn to page 380, please)

CONTROL GEAR ACCURACY

And You Control

The QUIETING of GEAR OPERATION

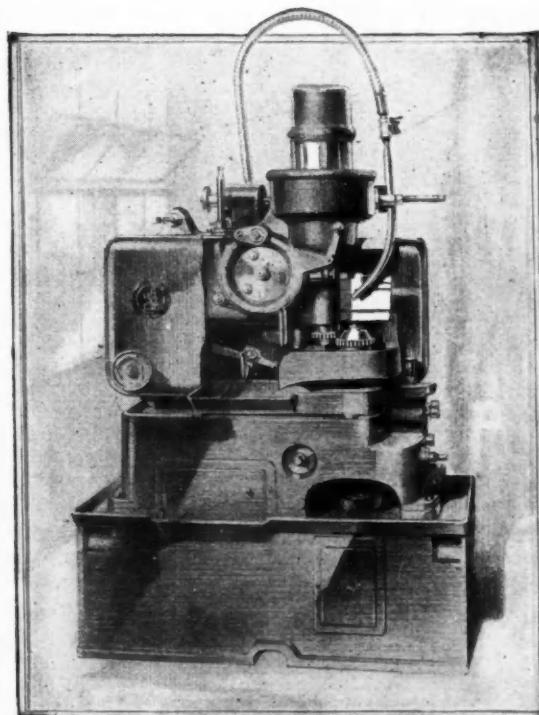
It is one thing to achieve perfection in gear design to meet a particular requirement. That achievement, however, is only as profitable as your ability to duplicate it successfully on a production basis. Right there is where you establish a measure of the ultimate economy of "Original Fellows" Gear Shaper Cutters.

By virtue of our exclusive cutter grinding methods, we can duplicate cutter designs with laboratory accuracy. And that advantage holds equally true, whether yours be a "true" involute or modified tooth profile.

This is the time that you may find unusual help in calling a Fellows Sales Engineer into conference on your gear problems. Write: The Fellows Gear Shaper Company, 78 River St., Springfield, Vermont (or 616 Fisher Building, Detroit, Michigan).



Original Fellows Cutters enable you to duplicate a successful gear design indefinitely.



Fellows Gear Shaper Methods afford complete control at all stages of gear cutting.

FELLOWS

~ GEAR SHAPERS ~

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

design requiring little mounting space and is dust-tight. These features of design are said to make the No. 2 Type ZO motor starter perfectly safe for operation in any adverse atmospheric conditions. It can be mounted right out in the plant alongside the motor it controls.

Infeed for Multiple Diameter Work

A semi-automatic infeed unit consisting of an improved means for rough and finish-grinding cylindrical shafts having multiple diameters has been developed by Cincinnati Grinders, Inc., Cincinnati, Ohio. This arrangement applied to a Cincinnati 14 in. x 18 in. plain self-contained grinder, illustrated, substantially increased the production of multiple diameter work and resulted in high labor savings.



The operation of machines equipped with this unit, is very simple. After the set-up and adjustments have been made, 13 minutes being required for the 6-diameter shaft illustrated, the unit requires very little attention until a different size shaft is to be ground. Once the shaft is placed between centers, it remains in position until completely ground.

The semi-automatic infeed unit is located on the bed of the machine, directly in the rear of the wheel head. Positioned in the rear of the unit is a flat master cam made up of a series of steps, each step corresponding to a diameter on the work being ground. The rear unit also contains six solenoid stops. When in use, these stops act to control the longitudinal travel of the master cam, so as to bring the proper step on the cam in line with a positive block stop. This block stop contacts with the step on the cam, representative of the diameter of the work ground.

A master drum switch with a star control wheel having six notches (for use with job shown) is located on the front of the machine. This control wheel is indexed by station dogs as the table is hand traversed.

As the cross feed hand wheel is given a one-eighth turn counterclockwise, a valve is opened which operates a piston which controls the cam bar. The wheel head travels rapidly toward the work until the positive block stop contacts with the proper step on the cam. Limits of plus or minus 0.002 in. are held on all diameters.

Cushman "Cushmatic" Electric Chuck

A line of "Cushmatic" electric chucks has been placed on the market by the Cushman Chuck Co., Hartford, Conn. It has two distinct units, each of which is complete in itself. They are connected by a draw bar and a control box arranged to regulate its pull. Flexibility of the grip through resistance in the line is obtained by using a special rheostat

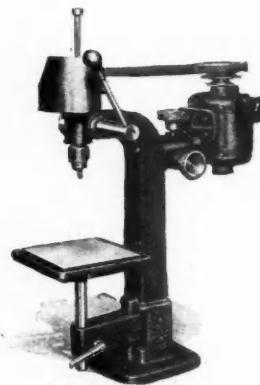
control. Several stages from maximum pressure are: 90, 80, 70, 60 and 50 per cent.

The typical chuck shown has a 1-hp., 1750-r.p.m. motor which at maximum pressure develops an energy of 3½ hp. This motor is available in 3 phase; 110, 220, 440 or 550 volts; 25, 50 or 60 cycle. Any other than three phase is considered special, and for such a transformer is recommended. The motor is bolted to the gear reduction housing, which is attached to the machine spindle. Power contact with the motor is provided by three collector rings and contact brushes at the rear end of the motor.

The reserve of power for gripping work is equal to the pulling power of the machine. This affords a maximum feed up to the allowable limit of the work; also, such a control of the gripping pressure that the piece being held need not be distorted.

Buffalo 10 in. Heavy Duty Drill

A 10 in. heavy duty drill recently added to the line of the Buffalo Forge Co., Buffalo, N. Y., has a capacity of ½ in. in cast iron and three spindle speeds: 3000, 1750 and 850 r.p.m.



A ¼-hp., 1725-r.p.m. vertical ball bearing motor, high starting torque type, drives by means of balanced 3-step V-belt, die cast cone pulleys. Furnished with No. 6-A Jacobs chuck; capacity up to ½ in.

Weight of drill with motor is 105 lb.

De Luxe Universal Reamer Sharpener

A Universal reamer sharpener with a capacity from ⅜ to 1⅓ in. diameter and up to 18 in. in length has been announced by the De Luxe Products Corp., LaPorte, Ind. It will hand straight fluted or spiral reamers. According to the manufacturers, this tool will increase reamer life and produce a fine cutting edge in five minutes or less and will remain oversize after 25 to 30 sharpenings.

